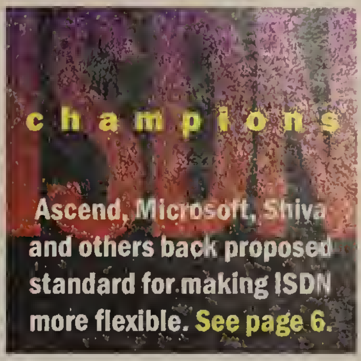
JANUARY 8, 1996 VOLUME 13, NUMBER 2

NetworkWorld

THE NEWSWEEKLY OF ENTERPRISE NETWORK COMPUTING



Ascend, Microsoft, Shiva and others back proposed standard for making ISDN more flexible. See page 6.

VG-AnyLAN camp aims for the 1G-bit mark

By Jodi Cohen

If you thought the fast Ethernet vs. VG-AnyLAN battle was over, think again. Proponents of the 100M bit/sec technologies are now taking their fight to a higher level — the gigabit level.

Work has begun in the IEEE 802.12 working group on a 1G bit/sec version of VG-AnyLAN, which is being backed by heavy hitters such as AT&T and Hewlett-Packard Co.

The 1G-AnyLAN technology would compete with Gigabit Ethernet, another emerging technology that Compaq Computer Corp., 3Com Corp. and Sun Microsystems, Inc. recently proposed (*NW*, Dec. 18, 1995, page 1).

The 1G-AnyLAN technology is expected to reach the draft standard stage this spring, said Daniel Dove, principal engineer at HP's Roseville Networks Division in Roseville, Calif. HP re-

See VG-AnyLAN, *page 54*

PICKING SIDES

Top network players are choosing between two emerging 1G bit/sec LAN standards. At least one company may back both approaches.

Gigabit Ethernet:
- 3Com
- Compaq Computer
- Sun Microsystems

1G-AnyLAN:
- AT&T
- Compaq
- Hewlett-Packard
- Motorola
- Texas Instruments

AT&T cutting deep

Telecom giant gets aggressive on rates, even before it yanks 40,000 in cost-cutting move.

By David Rohde

Basking Ridge, N.J.

The 40,000 layoffs AT&T announced last week make it clear that the carrier is serious about repositioning itself as a lean and aggressive machine for a new era of telecommunications competition.

STEVEN BORNS/COMPIX

AT&T *Chairman Robert Allen wants to see most of the layoffs made this year.*

But, in fact, the company has been quietly stepping up competitive efforts for months by reducing rates to among the lowest in key business service sectors.

With an enormous number of AT&T term contracts up for renewal in 1996 and the prospect of new firms entering the long-distance market if telecommunications reform becomes law this year, the carrier is prepared to use cutthroat pricing, observers said.

These circumstances help explain why AT&T Chairman Robert Allen is determined to cut most of the 40,000 positions this year, rather than waiting for the full downsizing to take effect

See AT&T, *page 53*

WHO'S LEAN AND WHO'S MEAN

On a per-employee productivity basis, AT&T must trim some fat to be as efficient as chief rival MCI. The RBOCs have their work cut out for them, too.

Carrier	1995 revenue (in billions)	Number of employees	Yearly revenue per employee
MCI	$15.0	40,000	$375,000
Sprint	$13.6	50,000	$272,000
AT&T	**$80.9**	**301,455**	**$268,365**
Bell Atlantic	$14.0	70,854	$197,589
Pacific Bell	$9.1	47,979	$189,666

GRAPHIC BY TERRI MITCHELL

NetworkWorld Fusion

http://nwfusion.com

Get more info on-line, including:
- **CEO Allen's message to employees.**
- **A Q&A with a top AT&T strategist on competition.**
- **A link to a Web site where AT&T employees can post resumes.**

Select News+ then Front Page.

SAP customers to get Notes integration wish

By Carol Sliwa and Barb Cole

Cambridge, Mass.

Lotus Development Corp. is pushing to ease integration between its Notes groupware and several brands of client/server applications, including those from SAP AG, according to industry sources.

An SAP spokesperson confirmed that the two companies have been talking, but with Lotus' Lotusphere '96 conference just two weeks away, no deal has been struck. Lotus declined to comment.

"Allowing integration between [an SAP application] and Notes would provide users with the ability to include SAP information in documents, decision-support systems and workflow applications," said Alyson Wald-

See Notes integration, *page 53*

Web of hate

White separatists leap on the 'Net.

By Doug Barney

*"The White Race wants *YOU* for web page construction."*

That simple plea is found nestled in a popular World-Wide Web site devoted to hate.

If that doesn't make you queasy enough, consider that this is just one of several sites aimed at recruiting, educating and militarizing white racists. And with the "Learn HTML" battle cry, many more are sure to follow.

These groups, long a staple of sleazy TV talk shows, have turned to the 'Net in droves, creating an interconnected world of paranoia, hate and violence.

See Hate, *page 8*

Sub-$500 'Net device prepped by upstart firm

By Kevin Fogarty

Seattle

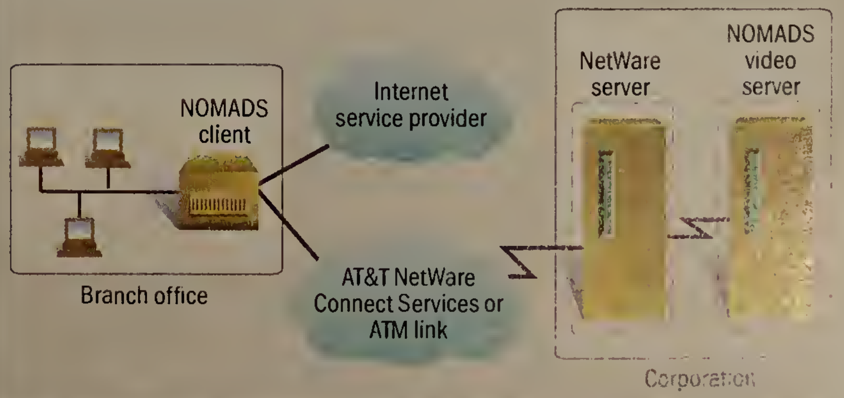
Industry giants IBM and Oracle Corp. each pledge to bring the Internet to the masses with access devices priced below $500.

But small-fry Stellar One Corp. may beat them to it. The

See 'Net device, *page 54*

CHEAP INTERNET ACCESS AND MORE

Stellar One's NOMADS client, a device priced below $500 that comes with Novell's Nested NetWare communications software, will provide high-bandwidth links from branch offices to the Internet. NOMADS also comes in the form of set-top devices that turn TVs into Internet terminals.



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This Week

News+

The Front Page:

- Nazis are on the Web, but so are groups like The Simon Wiesenthal Center and Yad Vashem, the Israeli Holocaust museum. See what they have to say.
- Find out what AT&T Chairman Robert Allen told his employees about his plans to eliminate 40,000 jobs.

The Technical Sections:

- Compare CDPD and circuit-switched cellular, in WANs & Internetworking.
- Download viewers for "portable" documents, in Electronic Commerce.

Forum

Your side:

Disagree with our list of the 25 most powerful people in networking? Who would be on your list? Topic 19 in nwfusion.talk.

"Wired Windows" columnist Dave Kearns makes his Web debut in an interactive column that lets you talk back. What are your Windows issues?

Other areas

- **Professional Development:** New seminars.
- **DirectConnect:** Download demo software.
- **Network World Central:** Get in touch with us.

this week's pick

Digital Equipment Corp.'s new Alta Vista site provides not only a fast index to Web documents, but also a real-time index of postings to thousands of Usenet conferences — handy if you're at the end of a slow Usenet link. Climb the search heights at http://www.altavista.digital.com.

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10 **Brainstorm tool to foster** Web-to-Notes links.
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16 **Bay revises its shipment for** 10M/100M bit/sec Ethernet switching modules.
16 **Tool linking databases to** the Web gets Basic-like scripting language.

Umang Gupta's *departure as CEO from his namesake company is part of a larger shakeup. Page 10.*

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17 **StrataCom turns** up switched virtual circuits for its ATM switches.

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Wireless 'Net access
How to get on-line when there is no phone in sight. See page 24.

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Buyer's Guide — Document management systems: *A new standard promises to make system parts interchangeable, but integrators will stay busy for a while.* **Page 38.**

NetworkWorld TEST ALLIANCE **Review:** *These three electronic document publishing applications make it easy to share diverse formats across an enterprise.* **Page 42.**

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Electronic Commerce

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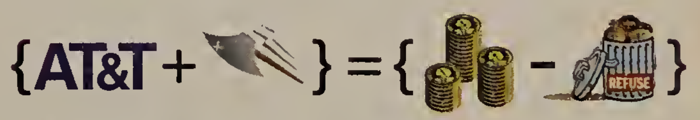
32 **Mike Rothman** says POP mail doesn't look bad for its age.
36 **Editorial:** Watch your language!
36 **Anura Guruge** says IBM must bridge SNMP and NetView/390 to maintain its market lead.
37 **Jim Cavanagh** suggests using gatekeepers to control 'Net abuse.
33 **Mark Gibbs** delivers a test to measure Internet product vendors' sobriety.



55 **Back to Reality:** AT&T's plan for deregulation comes at a big human cost.
55 **Abend:** A compilation of on-line oddities.

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Editorial and advertiser indexes. *Page 52.*

NetworkWorld's *Mission: To provide news and analysis that help network IS professionals deliver the network computing infrastructure and distributed applications required to meet evolving business needs.*

News briefs, January 8, 1996

AT&T to make Interchange change

Amid radical restructuring companywide, AT&T is attempting to breathe new life into its year-old Business Network on-line service. The company last week said the service will move to the World-Wide Web from its proprietary Interchange platform in the middle of this year. Such a move would give users consistent interfaces, formats and commands across the AT&T service and other Web services. That would eliminate the need for proprietary Interchange client software on user desks, said Michael Kolowich, president of AT&T New Media Services, the fledgling AT&T division that runs the Business Network. AT&T bought Interchange On-Line Services from Ziff-Davis in 1994.

Executive changes

MAXM's *Dawson*

MAXM Systems Corp. last week named Brendan Dawson, former chief operating officer at LEGENT Corp. and a veteran of 28 years at IBM, as its new president and chief executive officer. Dawson succeeds Jack Reis, who was prompted by the MAXM board to step down due to differences in strategic direction, according to analysts.

Separately, Hewlett-Packard Co. named Olivier Helleboid to replace Robert Hoog as general manager of its Network and Systems Management Division. Hoog last month left HP to join Siemens Nixdorf InformationsSysteme AG in Germany. Helleboid had been general manager of HP's Computer Systems Organization.

Bay, Cisco make progress

Bay Networks, Inc. and Cisco Systems, Inc. last week separately reported progress in integrating product lines obtained through acquisitions. Bay said users can now launch Xylogics, Inc.'s Annex Manager application, which governs the company's Remote Annex product line, from Bay's Optivity management system. Cisco said access, switching and Internet software products from Combinet, Inc., Grand Junction Networks, Inc., Internet Junction, Inc., Kalpana, Inc. and Newport Systems Solutions, Inc. now contain Cisco's Internetwork Operating System software, which can be managed from the company's CiscoVision management application. They are now offered under the CiscoPro name.

The latest on SNMPv2

The Internet Engineering Steering Group last week upgraded seven Simple Network Management Protocol Version 2 documents to draft standard status from proposed standard status. Unfortunately, the documents do not include SNMPv2 administrative framework and security functions, two aspects of the protocol's development that splintered the SNMPv2 working group and forced its disbandment. Work on those two features continues.

More Pentium power

Intel Corp. last week announced new 150-MHz and 166-MHz Pentium processors, touching off a slew of server announcements. Among the companies that will offer servers based on the new processors are Digital Equipment Corp., Hewlett-Packard Co., Panda Project and Unisys Corp. Compaq Computer Corp. said it had no immediate plans to offer servers featuring the more powerful Pentium chips.

Network World seminar alert

NetworkWorld
TECHNICAL SEMINARS

A two-day seminar series called Internetworking: Designing LANs, WANs & Broadband Networks and run by the Network World Technical Seminars program will begin in Irvine, Calif., Jan. 17 and end in San Francisco on June 12. The seminar series will tour 10 cities in all. It will be led by Mark Miller, president of DigiNet Corp. and a contributing editor to *Network World*. The seminar costs $895. For more information, call (800) 643-4668.

ISDN kingpins push for standard protocol

BACP would make flexible bandwidth easier to set up.

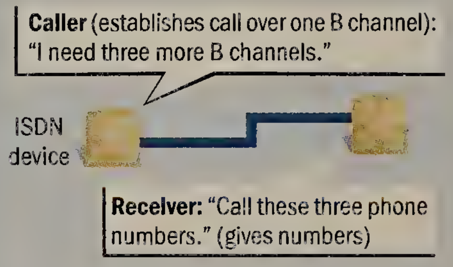
By Tim Greene

Seven industry heavyweights are coming to the rescue of users that want ISDN lines to accommodate changing bandwidth needs, a capability rendered difficult today due to the proprietary protocols vendors employ.

The answer, according to Ascend Communications, Inc., Bay Networks, Inc. (including its Xylogics division), Cisco Systems, Inc., Microsoft Corp., Shiva Corp., 3Com Corp. and U.S. Robotics, is the Bandwidth Allocation Control Protocol (BACP).

LET'S TALK

With the Bandwidth Allocation Control Protocol, equipment from different vendors can negotiate adding and dropping ISDN B channels as needed.


Caller (establishes call over one B channel): "I need three more B channels."
ISDN device
Receiver: "Call these three phone numbers." (gives numbers)

Caller makes the calls, and the two devices use the bandwidth based on the PPP specified by RFP 1717.

BACP would remove a major stumbling block to ISDN use: the ability during a call to add and subtract bandwidth in 64K bit/sec chunks, even if the devices at the either end of the call are made by different vendors.

Static guard

Today, incompatible equipment usually cannot exchange the information needed to scale links up or down, so the bandwidth remains static, according to Bob Larribeau, director of the California ISDN Users Group.

If devices at either end of a line used a standard protocol, they could add and drop channels as needed (see graphic).

For example, telecommuters using a single 64K bit/sec Basic Rate Interface line could jump up to 128K bit/sec by bonding in a second B channel for large file transfers.

Corporate users of a Primary Rate Interface could bump up bandwidth to 384K bit/sec for a videoconference.

Reaching an agreement

Ascend had been pushing its own protocol, called MP+, for the industry standard but backed off to support BACP, which was written by Shiva and modified with collaboration from the other companies.

Bernie Schneider, vice president of marketing for Ascend, said it was more important to get industry agreement on one standard, rather than cling to the protocol it authored.

"We know that standards are an absolute must for the [ISDN] industry to grow and flourish, particularly with Internet growth," he said.

Schneider added that the company would continue to use MP+ in its equipment but it would add BACP if the protocol becomes a standard.

Rich Eastman, vice president of engineering and network design for Virtual Presence International, which uses ISDN for videoconferencing among members of the World Trade Centers Association, likes the idea of a standard.

Even within the association, different sites use different equipment, he said.

"To have a dynamic increase and decrease of bandwidth now, we have to have the same manufacturer's equipment at each end," Eastman said.

When the equipment is from different vendors, he has to manually dial up additional channels to get enough bandwidth for a videoconference.

Dial up more info on-line, including:

- **The complete draft BACP specifications**
- **The PPP Multilink RFC on which BACP is based**
- **Background documents on ISDN**
- **From the main menu, select News+, then WANs and Internetworking.**

NetworkWorld Fusion

If there was a standard, that additional bandwidth would be set up by the equipment itself.

BACP has been presented to the Internet Engineering Task Force (IETF) because BACP builds on the PPP and Multilink Protocols, which fall under the IETF's purview.

While some BACP backers will wait to see if the technology is accepted as a standard before building it into a product, Microsoft plans to support BACP in Windows NT later this year. ■

How do the management costs of leased lines compare with those of frame relay nets?
NetworkWorld Fusion
Share your insights with other networking professionals on-line.
Select Forum, Conferences then Topic 17 in nwfusion.talk.

NetTech to ease management of net performance

By Michael Cooney
Raleigh, N.C.

New management software from NetTech, Inc. will let users more easily track and control performance across SNA and LAN environments.

During the next few months, the company will roll out new tools for its EView/Open family of management software that let users monitor the performance of complex, multivendor networks. The software also will help them more efficiently handle network troubleshooting, capacity planing and service-level tracking.

"The inability for most users to track the performance of the network and network devices, especially as users move away from mainframe-based tools, is a detriment to their business," said Ellis Gregory, president of NetTech.

The NetTech products will come in two phases. The first, an EView performance management application, will let users monitor the performance of their SNA nets from the console of any industry-standard Simple Network Management Protocol-based system, such as Hewlett-Packard Co.'s OpenView or

See NetTech, *page 10*

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32-bit Windows-based VxD kernel for high performonce TCP/IP	YES	NO	NO
Integroted multi-formot document viewer ond imoge viewer/converter (KEYview)	YES	NO	NO
An efficient ond secure IP Seriol to LAN switching copobility	YES	NO	NO
Extensive support for diverse network infrostructures (X.25, Wireless, ISDN)	YES	Partial	NO
Automotic router discovery/MTU discovery	YES	NO	NO
Advonced network troubleshooting tools (OnNet hos IP Troce, Ping & Retriever)	YES	Partial	YES
Automotic scripting copobility (Registrotion Wizord)	YES	NO	NO
SOCKS v4 network firewall support	YES	NO	NO
Networe IP 2.1 (run Networe opplicotions over IP)	YES	NO	YES
NetBIOS over TCP/IP	YES	NO	YES
NFS file locking	YES	NO	YES
A single vendor for host occess, resource shoring, tronsport, Internet client and server with o worldwide soles ond support orgonizotion.	YES	NO	Partial

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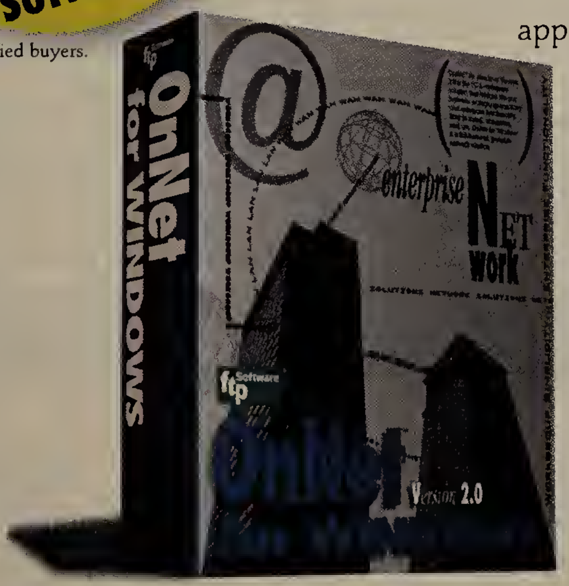

Add it all up and nobody delivers more power, more flexibility, more award-winning internetworking applications than the new OnNet for Windows. Its 32-bit NFS client, along with its suite of Windows Sockets applications, make it perform seamlessly across any platform. Run it on older Windows platforms, or really fly on Windows® 95 and Windows NT®. OnNet lets users go anywhere — across the enterprise or across the globe — to perform a full range of networking tasks while delivering advanced security features. OnNet's VxD-based stack is the world's most trusted TCP/IP kernel, field-proven by over 4 million users. Plus, OnNet is backed by FTP Software's outstanding support. So, rip this out and start shopping. Or save the frustration and call us now. OnNet for Windows *is* the solution.

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Hate

Continued from page 1

This recent 'Net posting says it all. "We are in your police forces, your schools, your church's [sic] and your business's [sic]. Now we are in your BBS' [sic], your FTP's [sic], your servers and the Web."

For dedicated racists, or the intellectually curious, finding these sites is as easy as tapping a few keywords into their Web search engine. Lots of them will do: "Ku Klux Klan," "Nazi," "fascist," "white power." There are so many that they can pop up by accident, say if you query "Talmud" or even just "white."

Once you are connected, you will discover a remarkably organized series of stitched-together sites, in essence, creating a larger virtual community.

Take the 1st WWW Banned Media Page, for example. This site includes dozens of links to like-minded Web pages, such as The National Alliance, Aryan Crusader and Resistance Records. It also lists dozens of Ku Klux Klan addresses, skinhead organizations, book companies and hot lines — everything one would need to become part of the movement.

From that page, you can hot-link over to Stormfront, where you can download Nazi and white power graphics, catch up on the latest news (with a unique spin) or link over to enemy sites, such as those expostulating the truthfulness of the Holocaust.

Remarkably, one Jewish site links back to White Aryan Resistance (WAR), a group run by Tom Metzger, a renowned white supremacist found guilty of encouraging his skinhead followers to kill an Ethiopian immigrant.

Already, this vast array of sites has been effective in recruiting new members and uniting the various splinter groups. Everywhere you turn there are phone numbers, fax numbers, electronic mail addresses, postal addresses and hot lines, all there to make it easy to join up.

Anti-Semitism sites

While nearly everyone is a target on the 'Net, anti-Semitism seems to be the most prominent form of hate.

Many are not too thrilled with these sites. Yosef Kazem, director of activities with the Central Organization for Jewish Outreach in Brooklyn, received this electronic message from one of the organization's members:

"Dear Friend:

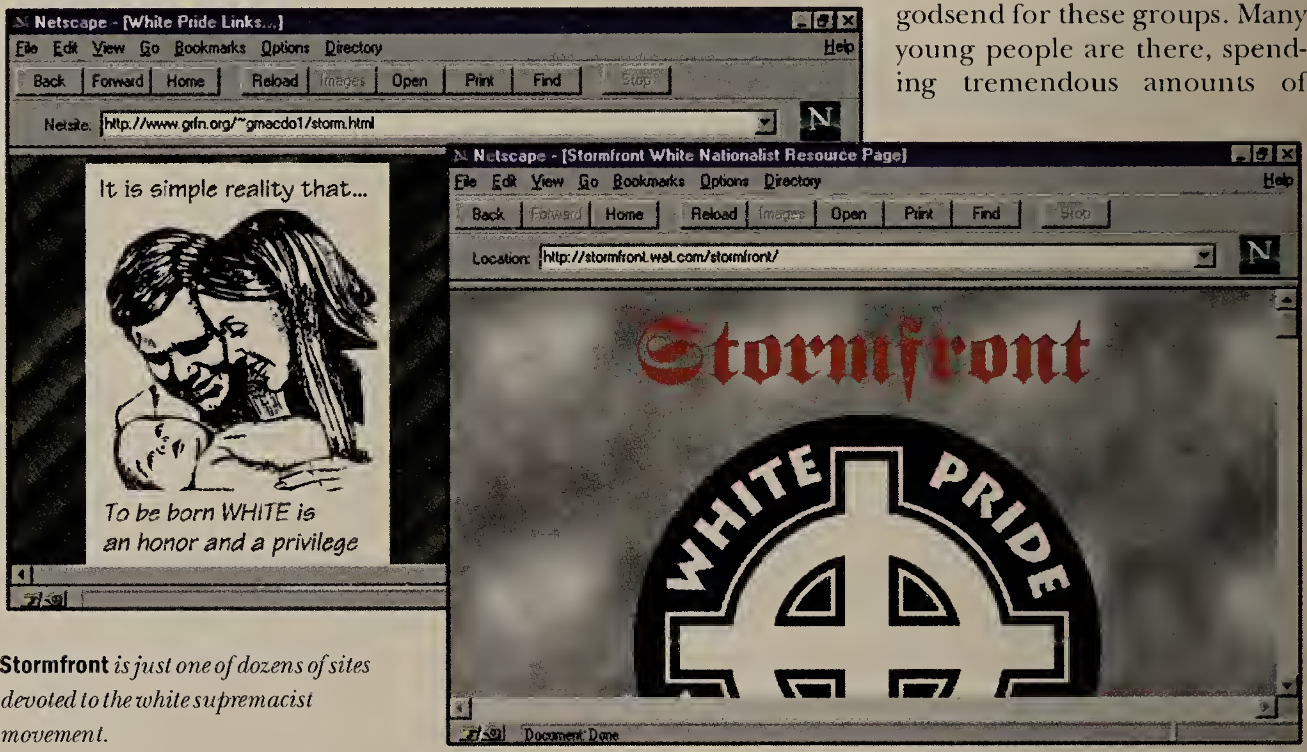
"There's a new presence out on the net. One that is spreading hate of the most vile sort. One that believes if your [sic] a Jew, the best place for you is the oven, and if your [sic] a non-white, the best place for you is 'back where you came from.' And they have found a great new way to spread their message, via the World-Wide Web."

How did Kazem's organization mate find this stuff? Probably just by searching for "Jewish," which can turn up a long list of anti-Semitic sites.

Kazem's group has hunted down the service provider for The National Alliance, which it says publishes white supremacist literature, and tried to pressure the provider to close down the site. It didn't. Citing the First Amendment of the Constitution, service providers have been reluctant to restrict sites that are not illegal. The National Alliance calls its tracts "patriotic."

Kazem actually sees a positive side to these sites. By posting their addresses, fundamental tenets and activities, these groups are easier to track, he argued. "The more they expose themselves, the worse off they are going to be," Kazem said.

In fact, their presence can serve as a reminder of just how wrong hate is. Kazem suggests that those opposing hate groups create their own sites and provide links to offending pages. "Then they can say, 'Here is the good and here is the bad,' " Kazem said.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http://stormfront.wat.com/stormfront/

Stormfront *is just one of dozens of sites devoted to the white supremacist movement.*

The 'Net has become a place where people regularly clash over issues of race or, in some cases, sexual preference. Sometimes it is fairly innocuous. Messages are passed back and forth disagreeing, with maybe a bit of name calling.

Other times it can get more serious. For instance, a 'Net surfer from Amsterdam got into some on-line sparring with an American, who finally offered $150 to anyone who would beat up the Dutchman simply because he was a homosexual.

Amy Hobson got a taste of hate when she browsed and found the Stormfront page. "It made me sick to think that this sentiment of white power and the separatist movement was so widespread," Hobson said. Upset, she posted a message taking issue with Stormfront members' racist views.

This is what she got in return: "You would have been the first person Hitler put in the gas chamber. LOSER LOSER LOSER LOSER LOSER LOSER LOSER LOSER LOSER LOSER LOSER LOSER."

White power marketing 101

The Simon Wiesenthal Center, a Jewish human rights organization in Los Angeles, has been tracking this type of 'Net activity for about 18 months. According to the center, there are about 250 hate groups, 25,000 committed white supremacists and 3,000 to 5,000 racist skinheads in the U.S.

However, these numbers have been fairly steady. "It has been virtually impossible for these groups to market their ideas in the mainstream," said Rabbi Abraham Cooper, associate dean of The Wiesenthal Center.

"You have the right to write this stuff, but you won't find the Book of the Month club carrying it," he added.

Instead, these groups have tried trash TV talk shows, public access TV, satellite TV and short-wave radio, but each approach is severely limited. The answer? Web sites for whites.

Although viewed by some as intellectually backward when it comes to technology, these groups are actually highly advanced. "The lunatic fringe does not automatically connote a lack of sophistication. They are embracing [the 'Net] more quickly than the rest of the population," Cooper said.

"The Internet is literally a godsend for these groups. Many young people are there, spending tremendous amounts of time, and it is virtually unmonitored," he said. "When you want to use it as a direct marketing tool, you can. And when you want to do a quick hit-and-run hate attack, you can use an anonymous address."

Many have done the hit-and-run, blasting out racist E-mail to thousands of 'Net users. That is more annoying than effective. But a well-done Web site gives a "veneer of acceptability," Cooper argued, which could help persuade surfers to adopt more extremist views.

Due to the racist Web explosion, The Wiesenthal Center is taking a controversial position. "The 'Net affords the opportunity to make the equivalent of an obscene phone call. But not all speech is free; not all speech is permitted," Cooper said.

Believing this, The Wiesenthal Center will be approaching Internet service providers to set "rules of engagement," which would limit that type of activity.

"We need to engage in a consortium, get some of the collective genius that create the 'Net and the providers to come up with technology strategy," he said. "We will be approaching a couple of thousand companies and asking, do you have rules, and will you consider them?" ■

Controversy on the Web

Controversial Web sites are certainly popular.

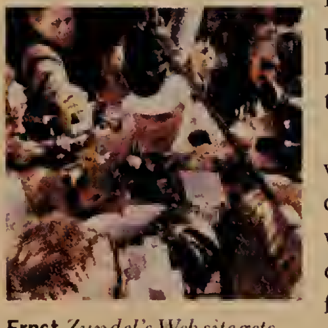
Ernst Zundel's site, which presents a revisionist viewpoint of the holocaust, had some 20,000 visitors in just three months.

Zundel, a highly opinionated Toronto-based publisher, already has 60 public access TV shows per week, a satellite TV show and four radio shows. The Web has more potential clout than all other methods.

"We think the Internet is the vehicle that will change the world," Zundel said, arguing that it allows dissidents to avoid being filtered by the "lapdog media" and speak directly to the people. "This levels the playing field," he added.

Starting this month, Zundel will begin advertising his site in magazines and on the 'Net itself.

Until now, it has not been easy for Zundel. Besides waging a nine-year legal battle in Canada over his views and facing two more criminal charges next month, his office was set on fire and a week later, someone attempted to bomb it.



Ernst *Zundel's Web site gets definite reactions.*

Things have been tough on-line, as well. His first service provider kicked him off last year due to complaints. "Their biggest Jewish customer found out [the site], and the next thing you know, I had five minutes before they closed us down. They wouldn't even allow me to put something on my Web page that we were being closed down."

In addition, Zundel has been the victim of sabotage. Opponents have distributed "disgusting material," which they falsely attributed to Zundel. And "someone from Russia filled our site with garbage, which took a week to clear up," he said.

So what does Zundel, who says he is not in it to recruit members, hope to achieve on-line? "My immediate goal as a German is to rehabilitate my own German people," he said.

Future plans include a Hebrew translation. "We have quite a number of visitors from Israel," Zundel claimed.

By Doug Barney

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Now you can have all the benefits of distributed computing with centralized control. And save huge amounts of administration time and money. Because our Solstice™ AutoClient™ solution eliminates almost all individual desktop administration. And puts desktop management on the server, where it belongs. You load the operating system and software only once, and desktops access it as needed. You maintain and troubleshoot from one location. You eliminate desktop backups and data restoration. And Solstice AutoClient reduces network traffic so dramatically that each server can handle up to three times more clients. Without sacrificing desktop performance. To know more, contact us at http://www.sun.com/ or 1-800-SUNSOFT, prompt #1.

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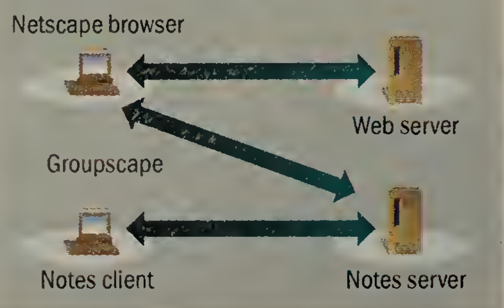
Brainstorm hatches tool for Notes-Web integration

By Carol Sliwa
Cambridge, Mass.

Lotus Development Corp. may want its customers to live within the Notes environment, but Brainstorm Technologies, Inc. is banking that lots of them would rather work within the friendly confines of their Netscape browsers.

BRAINSTORM BRIDGES THE GAP

Brainstorm's Groupscape software gives end users direct access to information on Notes servers via Netscape browsers.



Brainstorm this week will announce Groupscape 1.0, a tool that will permit companies to build and extend Notes applications so they can be used via Netscape Communications Corp.'s popular Navigator Web browser.

This would permit companies to standardize on Netscape's software as a front end to Web and Notes servers while taking advantage of Notes security and replication features on the back end.

Mitchell Liu, Brainstorm's cofounder and vice president of marketing, said his company is responding to two trends: that "everyone is onto this Netscape thing because it's easy to use" and that Notes users want to be able "to do things" while browsing in Netscape.

"With Groupscape, you can develop, for example, a sales force automation application, a human resources application or a project tracking application [to run on Notes servers]. And those applications can be seamlessly integrated right into Netscape . . . so the end user can't even tell that it's a separate application," Liu said.

Capt. Dick Ryder, a Dallas-based team leader with the Civil Air Patrol, said he will be evaluating Groupscape with basic database management and organization of aerospace educational information in mind. "It looks very promising" as a way to give people in the field access to corporate data without making long-distance phone calls, he said.

The first version of Groupscape will enable companies to build applications accessible from desktops running Netscape

See **Brainstorm,** ***page 54***

IBM prepping entry-level ESCON connectivity

By Michael Cooney
Fishkill, N.Y.

IBM this week will roll out a tabletop Enterprise Systems Connection (ESCON) Director designed to give users higher network availability and more configuration options than past offerings.

The 9033 ESCON Director Model 4 can link up to 16 downstream devices with mainframe resources. Users can reconfigure the Model 4 and set up redundant backup ports without having to take the director off-line, which interrupts enterprise data communications with the mainframe.

ESCON Directors are the traffic switches in IBM's fiber optic-based ESCON architecture. The director links and controls data flowing from peripheral devices — such as controllers and direct-access storage devices — to the mainframe channel over distances of about 12 miles and speeds up to 17M byte/sec. Traditional bus and tag copper connections in the same configuration are limited to 4.5M byte/sec of throughput and distances of about 134 yards.

The Model 4 supports eight ports and can be expanded to support 16 ports in increments of four. Upgrades can be added without taking the box down.

The box supports a fully redundant processor, a Token-Ring interface for LAN connectivity and other features that will guarantee 24-hour operations, IBM executives said.

The Model 4 eliminates the need for users to have two directors for backup in case of failure or the need to add more ports, IBM said.

The Model 4 is the second in a series of completely redesigned ESCON Directors built with IBM technology but manufactured by McDATA Corp.

Storage-maker EMC Corp. bought McDATA Corp. last year, but the agreement to produce the directors is still in place, an EMC spokesman said (*NW*, Oct. 30, 1995, page 16).

The Model 4 is a replacement for the ESCON Director Model 1, which IBM no longer sells. The other McDATA-built box, the Model 3, supports a minimum of 29 ports and is expandable to 124. The Model 3 is positioned as the high-end ESCON Director.

The new box is not compatible with Models 1 and 2 — users must upgrade to the newer boxes. The Model 4, however, can work with the Model 3.

"The Model 4 is a tactical weapon for IBM so that it can satisfy the needs of users looking to get into ESCON for the first time," said Anura Guruge, an independent analyst based in New Ipswich, N.H. "However, IBM has to at some point develop ESCON to handle ATM-like speeds on the channel, so other directors will be necessary."

The Model 4 will ship this month. Pricing was not available.

©IBM: (800) 426-2255.

COMMENTS?

See "How to reach us" on page 5.

New year brings new Gupta

Name change, new CEO and workforce reduction announced.

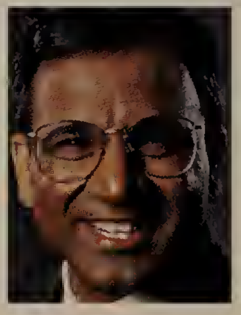
By Barb Cole
Menlo Park, Calif.

Good-bye Gupta.

Financially troubled client/server database and tool maker Gupta Corp. last week announced a reorganization plan under which Umang Gupta, company founder and chief executive officer, will depart and the organization will be renamed Centura Software Corp.

The company, which has lost more than $8 million during the past year, will slash its 380-employee workforce by 17%, a reduction of 65 jobs.

The layoffs will be designed to help the company return to profitability by cutting expenses.


Umang Gupta *will depart as chairman of the board in May.*

Gupta has fallen on hard times because of its failure to increase revenue fast enough to offset sales and marketing costs.

The moves may pave the way for Gupta to be acquired, something that Umang Gupta had reportedly been opposed to. Oracle Corp.'s offer for the company was reportedly rebuffed by Gupta and other high-level officials last year.

Samuel Inman, who joined Gupta last April as president and chief operating officer, will succeed the firm's founder. Observers said Umang Gupta's departure should be smooth since he abdicated much control to Inman over the past few months.

"I don't think it signals a major shift in terms of where they are headed," said Wayne Kernochan, an analyst at Aberdeen Group, Inc., a Boston-based market research firm.

Umang Gupta, a former Oracle executive, founded the company in 1984 with Bruce Scott and focused on PC-based databases and application development tools.

The firm's highly regarded SQLWindows application tool became popular, but the technology-driven Gupta proved to be no match for the marketing muscle of rival Powersoft Corp., now a Sybase, Inc. subsidiary.

During the early 1990s, the company made a play for the low-end development tool market, but that proved to be virtually locked up by Microsoft Corp. with its Visual Basic.

With Centura, a second-generation application tool designed to let developers build enterprise-scale applications using software components, the company is again eyeing the high end of the market. "The strategy of moving up to the high end makes the most sense for them," Kernochan said.

Umang Gupta will remain the chairman of the board through May. ■

NetTech

Continued from page 6

IBM's NetView for AIX. Until now, users had to monitor SNA device performance via mainframe-based NetView Performance Monitor (NPM).

The application works by tapping into existing SNA performance monitors on the mainframe, such as IBM's NPM or Computer Associates International, Inc.'s NetSpy program. It then uses NetTech's existing EView agent technology, which resides on VTAM and gathers SNA and MVS systems alerts and alarms.

The application then funnels response times and other performance data onto the SNMP management screen, thereby enabling users to see the response times of all devices in the enterprise from one screen.

In addition, EView has direct links to most industry-standard trouble-ticketing packages. So, for example, if a user employed the Remedy package on OpenView, EView would automatically notify the system of a performance problem and cut a trouble ticket to track the occurrence.

Phase II

The second phase of products basically moves the mainframe function to the LAN world. For instance, one application will enable EView to gather the performance statistics from any non-SNA devices, such as a LAN server or bridge/router.

"We're going to build [Remote Monitoring]-based agents that will send performance data back to the SNMP manager to help users identify bottlenecks and other performance problems, no matter what the device or its location in the enterprise," Gregory said.

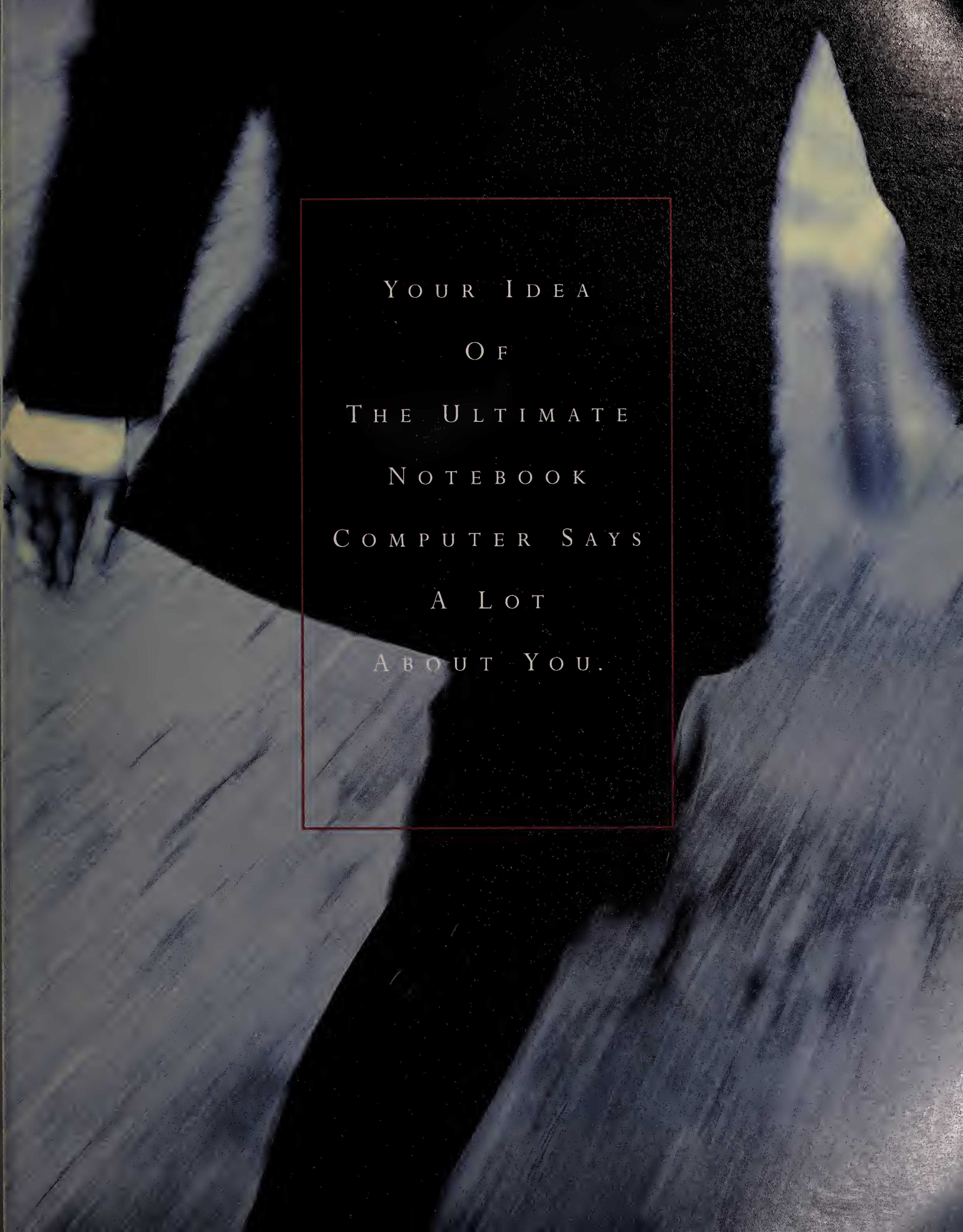
But users will not have to run out and buy another agent. Since everything will be standards-based, EView's Response Time Monitor also will be able to gather statistical information from existing RMON agents, he added.

The final piece of the Phase II products will be the integration of EView technology with industry-standard capacity planning and network modeling tools from companies such as CACI Products Co.

Analysts said the NetTech products should be of interest to larger users that have more complex net environments.

"These are the kinds of tools users need to be more efficient in their network operations," said Arnold Farber, president of Farber/LaChance, Inc., a data center automation consultancy in Richmond, Va. "Ultimately, however, how useful it is depends on how prepared the user is with modeling tools and other applications to use the data NetTech is providing."

©NetTech: (919) 781-7887.



YOUR IDEA
OF
THE ULTIMATE
NOTEBOOK
COMPUTER SAYS
A LOT
ABOUT YOU.

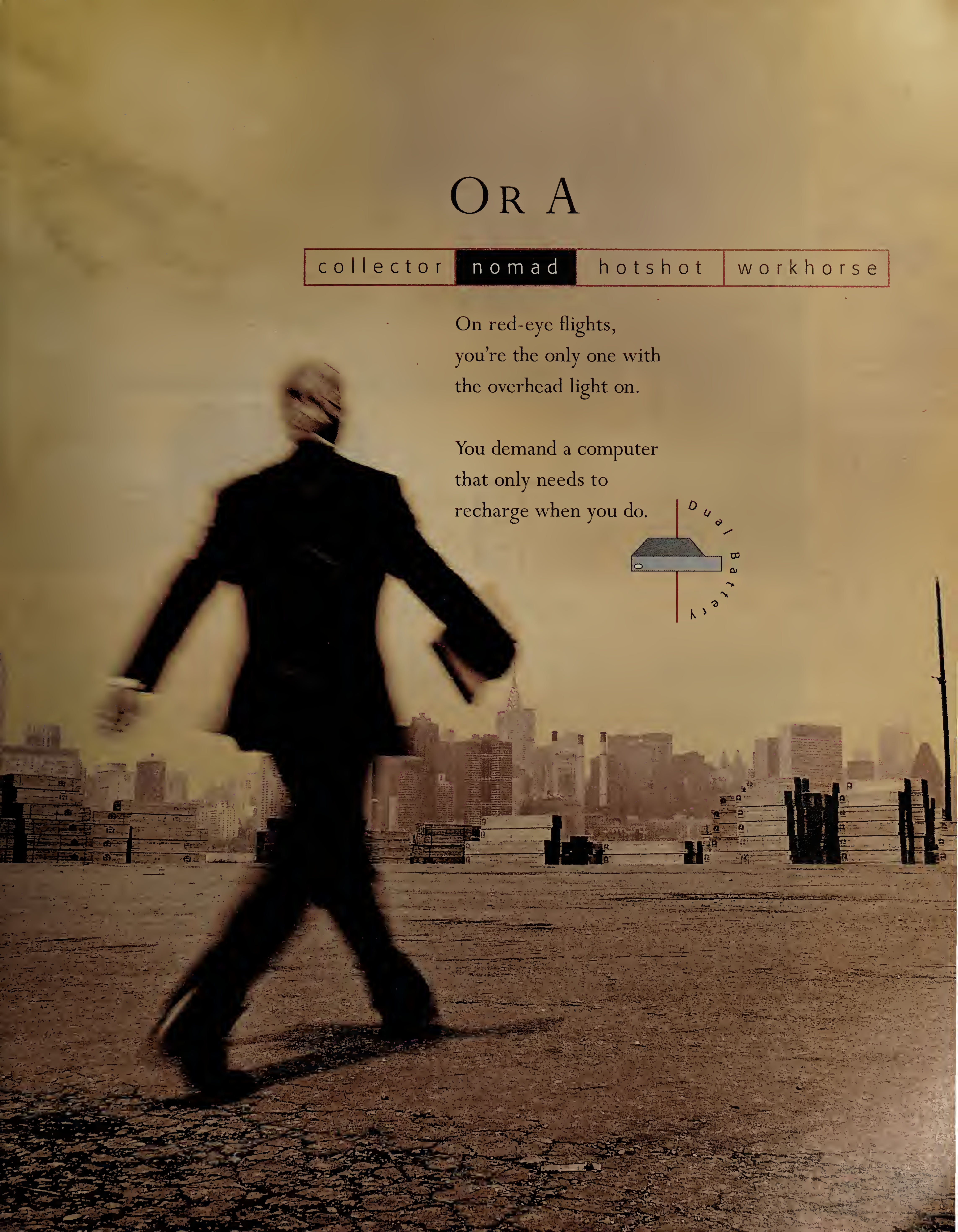
It Could Say You're A

collector | nomad | hotshot | workhorse

You still have the invitation to your 7th birthday party (and you know where it is).

The thought of a second 1.35-GB hard drive isn't astounding – it's necessary.

Dual Hard Drive



OR A

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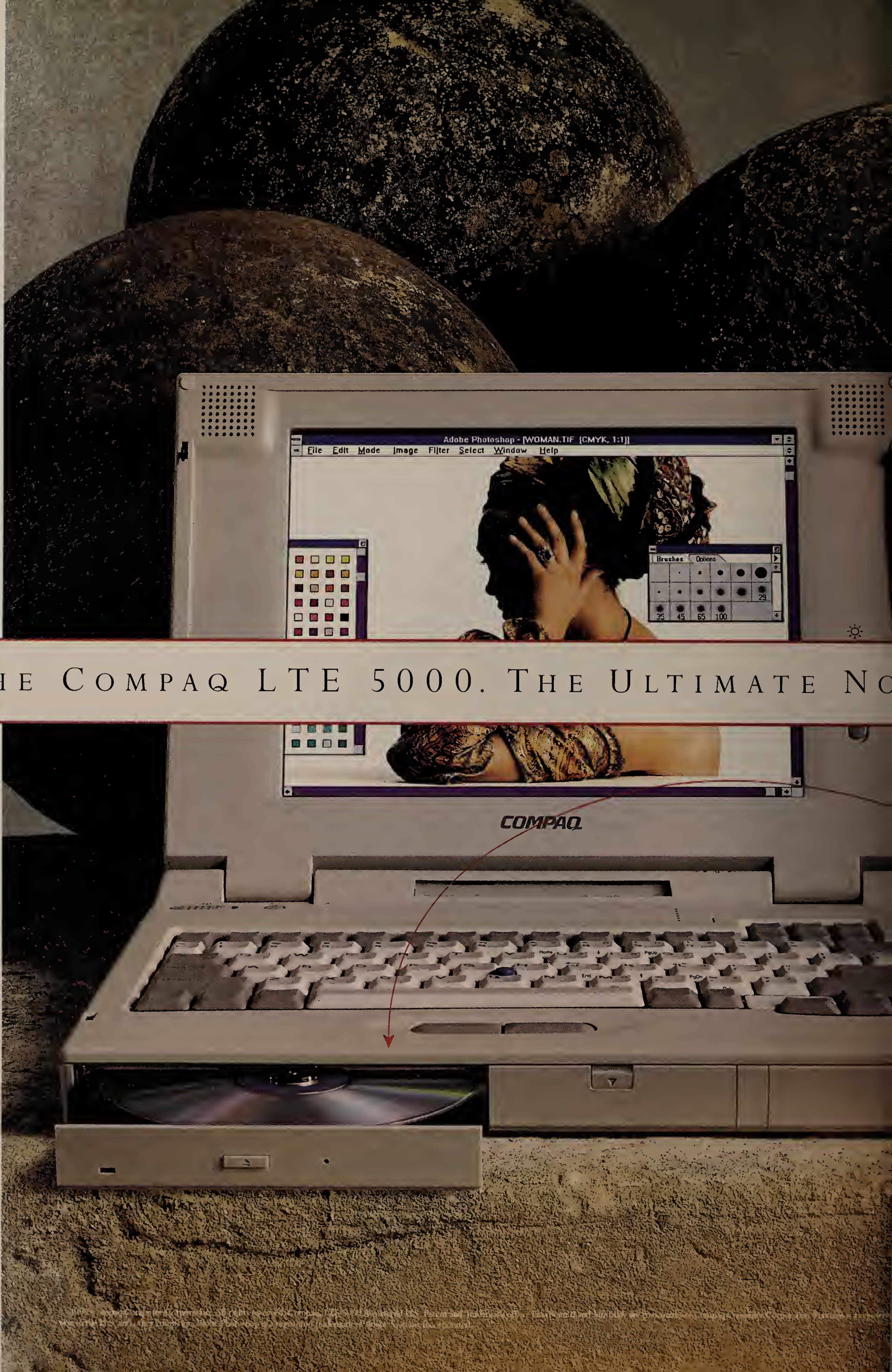
On red-eye flights,
you're the only one with
the overhead light on.

You demand a computer
that only needs to
recharge when you do.


THE COMPAQ LTE 5000. THE ULTIMATE NO
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File Edit Mode Image Filter Select Window Help
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TEBOOK FOR WHOEVER YOU HAPPEN TO BE.

You know exactly who you are. Well, at this exact minute. But the way things go, this probably changes several times a day. Which is precisely why we created the LTE 5000®. A Pentium® powered notebook featuring interchangeable devices, giving it the ability to change as quickly as you do. We started with features any self-respecting notebook user demands: a Pentium processor, a full-sized keyboard (complete with the EasyPoint II™ pointing device), an 11.3- or 10.4-inch 800 x 600 LCD screen and two PCMCIA slots. Then we added memory expandable to 72 megabytes, 16-bit stereo sound and speakers, and optional MPEG video. But we left the cool part — the interchangeable part — up to you. The LTE 5000 is completely modular. So you can mix and match capabilities at the drop of one of your many hats. For starters, there's a removable hard drive (going up to a hefty 1.35 gigabytes). A long-lasting lithium ion battery. And the kicker is the unique front-loading MultiBay — because it can do everything else. Running the world's biggest database? Use the MultiBay for a *second* 1.35-gigabyte hard drive. Making a multimedia presentation? Plug in a CD-ROM drive. Need more juice for a long flight? Plug in a second battery. Need to share some files? Plug in a floppy drive. In fact, the MultiBay is so useful, we built an expansion base featuring two of them. So in the office, you can be fully connected with everything working at once. And when you pack up, just configure the LTE 5000 for what you'll need on the road. It all adds up to a refreshing combination of the most advanced technologies and highly evolved common sense. Call it the technological cure for multiple personalities. Interested? Call us at 1-800-345-1518 (select PaqFax option) or visit our Web site at www.compaq.com.

Vendors vie to manage Web servers and apps

By Ben Heskett
Cambridge, Mass.

Investments by Tivoli Systems, Inc. and McAfee in a small Web software company may signal a trend for the new year: Network management vendors are developing products to help manage Web servers and applications.

Tivoli, which specializes in enterprise systems management, and McAfee, a security and network management company, have made separate equity investments in the start-up net.Genesis, based here, to expedite Web product development.

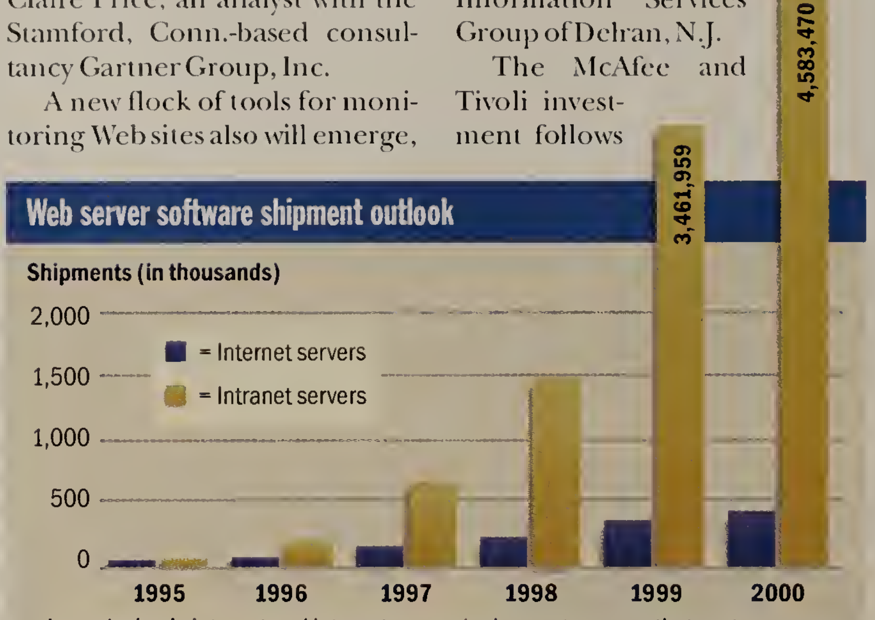
Although no product details are available, Tivoli and McAfee are expected to extend their product lines to support Web resources using net.Genesis' Internet expertise. In McAfee's case, that may translate into a Web-enabled SiteExpress — its software distribution tool.

Staying cutting-edge

Analysts said all major management vendors will have to offer products to manage the growing list of Web-based applications if they want to be seen as cutting-edge.

"Adding the whole Internet realm to network management just makes it all the more complex, and [the Web] is getting all the more vendors involved," said Ted Julian, an analyst with International Data Corp. in Framingham, Mass. "There is clearly the need for some standards and some broad-ranging tools."

Customers can expect vendors to offer security, distribution, configuration and performance-monitoring products for the Web. There also will be a lot of money made using the Web as a management tool, noted Claire Price, an analyst with the Stamford, Conn.-based consultancy Gartner Group, Inc.



An explosion in intranet and Internet server deployments means that customers will need to figure out a way to manage these resources.

A new flock of tools for monitoring Web sites also will emerge, including management wares that track employee use of the Web as it relates to productivity.

Fortune 500 companies, for example, are not sure what they need to address misuse of the Web during work hours, according to Mike Grayson, a computer consultant with Fig Tree Corp. in Plano, Texas.

The new tools will let companies collect information about Web use and determine, "Is this really a worthwhile thing to do or is [the Web] just some kind of toy?" said Jill Huntington-Lee, an analyst with Datapro Information Services Group of Delran, N.J.

The McAfee and Tivoli investment follows the announcement last month by Computer Associates International, Inc. of an HTML-enabled database product and accompanying tools for Web management.

Last November, McAfee announced WebScan, an antivirus software tool for the Internet that detects viruses during the downloading of files and use of electronic mail.

Hewlett-Packard Co. also has extended its OperationsCenter product in its HP OpenView family to provide Web-server monitoring.

Others join in

According to analysts, traditional network management vendors will be joined on the Web by companies with content management expertise, such as the directory services team at Novell, Inc.

Other vendors who can be expected to join the Web management fray include IBM and Seagate Technology.

Early customers will likely include corporations that have burgeoning intranet servers and Internet service providers that must guarantee service access.

"I am surprised that we haven't seen anything up to this point on this," said Huntington-Lee.

"If I were a vendor and wanted to jump on a bandwagon and make a lot of money fast, I would think this is certainly a way to do it," she added. ■

COMMENTS?

See "How to reach us" on page 5.

Bay delays 10M/100M modules

ASIC processor debugging contributes to LattisSystem lateness.

By Jim Duffy
Santa Clara, Calif.

Bay Networks, Inc. has delayed shipment of 10M/100M bit/sec Ethernet switching modules for the LattisSystem 5000 hub due to longer-than-anticipated development and extensive testing, company officials said last week.

The modules, initially slated to ship in the second half of 1995, will now ship in the first quarter of this year, said Peter Tarrant, Bay's vice president of hub product management. They are entering beta testing this month, he said.

The modules are delayed due to the time it has taken Bay to debug a new 10M bit/sec switching Application Specific Integrated Circuit (ASIC), integrate software with the System 5000 and test the products, said Tom Slykhouse, group product line manager for Ethernet switching at Bay.

Users and analysts, however, said the 10/100 switching module delay might be due to new 100M bit/sec switching and Remote Monitoring (RMON) ASIC development. The analysts, who requested anonymity, said the new switching ASICs will turn up in future generations of Bay's 28000 Fast Ethernet switch, a situation they said could shorten the lifespan of the current 28000 architecture.

"It looks like they aren't going to do anything to enhance the [current] architecture," said one of the analysts.

"I heard the specific problem was not related to the switching as much as it was to the RMON stuff," said Larry Foster, coordinator of internetworking services for Southern Illinois University in Edwardsville, Ill.

"Now they're trying to support all the layers of RMON" instead of a subset, he added.

"I heard the specific problem was not related to the switching as much as it was to the RMON stuff," said Larry Foster of Southern Illinois University.

Bay officials said 100M bit/sec fast Ethernet switching will continue to be based on the Fastframe architecture in the 28000 switch.

"The [28000] is stable and is going to continue to ship through the remainder of this calendar year as it currently exists," Slykhouse said. "This technology is being propagated into the System 5000 and, to the degree that we have other plans for similar products, it would follow suit, as well."

Bay officials would not comment on whether the 10/100 modules will sport ASICs supporting a full RMON implementation. ■

'Net tools

Web tool for databases gets scripting language

By Barb Cole
Honolulu

A small software company here is upgrading its tool for linking databases to the Web by adding a Microsoft Corp. Visual Basic-like scripting language, a sort of Java for BASIC programmers.

Aspect Software Engineering, Inc. will embed its iBasic language into Version 2.0 of its dbWeb software for accessing Open Database Connectivity-based data sources through Web browsers, company officials said last week. The dbWeb server-based software brings SQL data into Web sites.

The iBasic programming language will be familiar to the mass of Visual Basic programmers, said Jim Laurel, president of Aspect. Since it will be server-based, developers may make changes to applications without touching client-side code. Both Java and Microsoft's planned Visual Basic Script are client-based, he added.

The addition of a programming language to dbWeb will give developers more flexibility in the way they design Web-based database applications, Laurel said.

Cliff Willoz, director of systems integration for Delfin Systems, a Virginia Beach, Va.-based systems integrator that manages an Intranet application for the Department of Defense, said, "We'll jump on [dbWeb 2.0] because iBasic will help overcome some of the limitations of forms handling in HTML."

Close, but not the real thing

According to analysts, dbWeb 2.0 could be a tight package of Web tools and database connectivity for Windows developers, but they cautioned against thinking of it as a Java replacement.

"I'm not sure how many variations [of Java] will be tolerated in the market, but the idea of letting Windows programmers write server-side applications in a common language instead of C or Perl is interesting," said Michael Gould, an analyst at Patricia Seybold Group, Inc., a market research firm in Boston.

The $495 dbWeb is among a growing crop of third-party tools that have emerged lately to link corporate databases to the Web.

Another new market entrant, SQLWeb Technologies, Inc., has quietly begun shipping SQLWeb, which lets developers use a modified version of HTML to build Web sites that link to databases from Oracle Corp., Sybase, Inc. and Informix Software, Inc.

As a result, SQLWeb significantly reduces the time required to build Web-enabled database applications, since developing database-linked pages typically requires the use of C, Perl or a database-specific language such as Oracle's PL/SQL.

The server-based SQLWeb software runs on the same machine as the Web server. It currently runs on several flavors of Unix and Windows NT. Pricing ranges from $495 to $2,495.

The company also plans to support Microsoft SQL Server databases.

☎Aspect: (808) 539-3781; SQLWeb: (410) 203-1999.

WANs & Internetworking

Covering: Network Architectures • Net Management • Mobile Computing
Local/Long-Distance Services • Routers • Muxes and other CPE

Briefs

Symplex Communications Corp. *is now shipping a new addition to its DirectRoute* **router line.** *The DR-1 Primary Rate Interface (DR-1/PRI) router is a stackable device that supports a single ISDN PRI. The PRI sports an integral channel service unit interface, and the router features one Ethernet attachment and two serial interfaces for use with any combination of leased lines, frame relay and switched 56K bit/sec services.*

The DR-1/PRI costs less than $5,000.

Symplex: (313) 995-1555.

Long-distance **caller identification information** *between Ameritech Corp. and US WEST, Inc. now includes the* **name of the party** *from whose phone the call was placed. Both of the regional Bell operating companies said they were negotiating similar agreements with other RBOCs. A federal ruling ordered sharing the number of the calling party as of Dec. 1, 1995.*

No. 8 long-distance carrier **Midcom Communications, Inc.** *of Seattle last week introduced Midcom Advantage, a* **package of multiple services,** *including long distance, calling card, conference calls, fax, private lines, frame relay and enhanced 800 routing. Users can combine Midcom Advantage services for maximum discounts.*

In the **Notes technical support** *area, CompuServe has added The Burton Group News Analysis;* The View, *a Notes software technical journal; and the* Vendor Services Guide *to Notes-oriented services and products. In the financial area, CompuServe has made available The Value Line Mutual Fund Survey, The Value Line Investment Survey, Morningstar, and the "Kiplinger Washington Letter" and "Kiplinger Tax Letter." The Comtex Newsroom and the Commerce Business Daily have joined the company's news and general interest area.*

MCI captures military services' ATM network

By David Rohde
Washington, D.C.

MCI Communications Corp. has won a Department of Defense contract to transport critical weather and oceanographic data among four military sites over the carrier's commercial ATM network.

The new Navy-Air Force ATM Communications Service continues the military's leading role in wide-area deployment of Asynchronous Transfer Mode.

But like many current ATM applications, the service sticks to high-speed data transfer, rather than the true multimedia capabilities frequently touted for ATM.

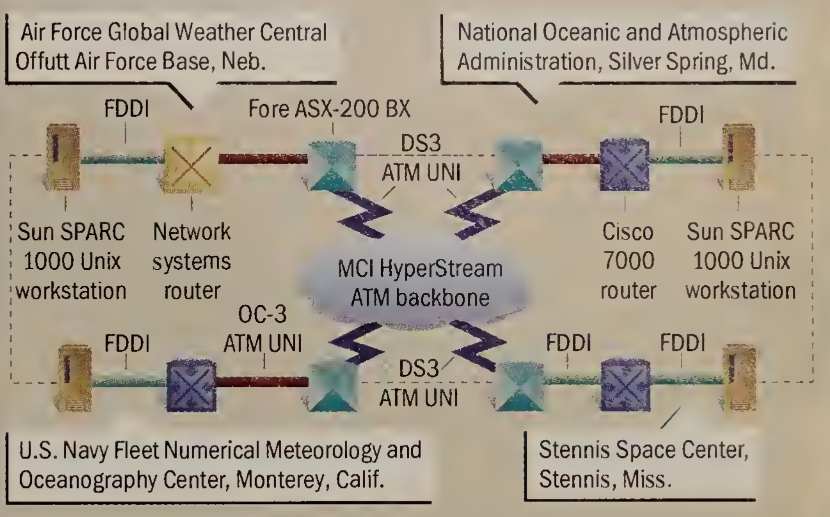
The contract calls for Class C variable bit rate ATM transport at DS3 (45M bit/sec) speeds with an option to boost throughput to OC-3 (155M bit/sec). It does not currently call for any constant bit rate traffic such as voice or real-time video.

The Defense Department will use the network for the output of numerical weather and ocean prediction models, as well as to process meteorological satellite data. The network also will serve as the platform for key civilian government agencies, such as the National Oceanic and Atmospheric Administration (NOAA), to exchange instantaneous weather along with oceanic information with the military.

MCI officials hope the contract will provide them with momentum for further ATM buildouts with the military. "Ultimately, they hope they'll be able to get ATM to the foxhole," said Diana Gowen, MCI's director of Defense Department programs.

ON LAND, AT SEA AND IN THE AIR

The initial network architecture for the new Navy-Air Force ATM Communications Service:


Air Force Global Weather Central
Offutt Air Force Base, Neb.
National Oceanic and Atmospheric
Administration, Silver Spring, Md.
FDDI
Fore ASX-200 BX
DS3
ATM UNI
FDDI
Sun SPARC 1000 Unix workstation
Network systems router
MCI HyperStream ATM backbone
Cisco 7000 router
Sun SPARC 1000 Unix workstation
OC-3
ATM UNI
FDDI
DS3
ATM UNI
FDDI
FDDI
U.S. Navy Fleet Numerical Meteorology and
Oceanography Center, Monterey, Calif.
Stennis Space Center,
Stennis, Miss.

PVCs provide full meshing. An additional 17 sites may be added to the net during the term of the contract.

GRAPHIC BY TERRI MITCHELL

Key factors

Both the speed and flexibility of ATM were key to the decision by the contracting arm of the Defense Information Systems Agency (DISA) to request bids

See **ATM net,** *page 20*

StrataCom joins ATM SVC club

By Tim Greene
San Jose, Calif.

The reality of carriers offering ATM switched virtual circuits is getting closer as StrataCom, Inc. last week joined the ranks of vendors whose switches support SVCs.

The StrataCom software offering for its BPX backbone switch is being beta-tested this quarter by private enterprises that use the BPX as a campus switch and by carriers.

StrataCom expects to have the software available for its smaller IGX switch in the second half of this year.

The company said it expects that its carrier customers will trial the new software and offer services based on it next year.

That is significant because part of the StrataCom game plan

See **StrataCom,** *page 20*

Products track high speeds, LANs/WANs

Armon and Axon apply RMON-like functions to FDDI as well as frame relay.

By Jim Duffy

Two network management vendors have rolled out products designed to offer users more detailed analysis of high-speed LANs and wide-area links, including frame relay.

Armon Networking, Inc. is the latest LAN probe company to roll out traffic monitoring gear for 100M bit/sec FDDI nets. In addition, Axon Networks, Inc. has extended its LAN analysis and diagnosis expertise to WANs so users can, for example, determine if they have contracted for too much or too little bandwidth.

Armon puts FDDI OnSite

- **OnSite FDDI Probe** supports RFC 1757 and RFC 1513 RMON MIB standards. It costs $9,500 for a single-attach station configuration and is available now.
- **OnSite Manager** applications also support RFC 1757 as well as LLC statistics and packet capture and decode capabilities.

"We're seeing a lot of folks that want to extend the information they're getting at the Ethernet level to backbone networks that interconnect multiple LANs," said Tim Wilson, senior consultant at Decisys, Inc. of Herndon, Va.

Armon's new OnSite FDDI Probe extends the Remote Monitoring (RMON) Management Information Base (MIB) to FDDI LANs. The OnSite FDDI Probe hardware is based on Intel Corp.'s 33-MHz i960 Reduced Instruction Set Computing processor and is available in single- and dual-attached models.

Armon also unveiled Unix-based OnSite Manager applications for viewing data gathered by the probes from a management console.

The applications enable users to capture and decode FDDI Logical Link Control-layer statistics and Station Management frames.

The OnSite FDDI Probe is priced from $9,500 to $11,000. OnSite Manager applications for FDDI analysis cost $6,600.

The products are available now.

Armon competitors Frontier Software Development, Inc. (*NW,* March 20, 1995, page 16) and Hewlett-Packard Co. (*NW,* Dec. 18, 1995, page 23) also offer FDDI probes, which are priced starting at $9,995.

Axon serves it up

Axon, meanwhile, took the wraps off its WANServant Manager and WANServant Probe for long-haul links. Although RMON MIBs are not defined for WAN links, WANServant applies RMON-like properties to analysis of WAN circuits.

WANServant Manager is an application that gathers utilization statistics from WANServant probes. In a frame relay network, WANServant Manager and WANServant Probe allow users to compare link utilization to a circuit's committed information rate to gauge transmission and cost efficiency.

The WANServant Probe is based on an i960 RISC MPU and can monitor line speeds up to 2M bit/sec using WAN and frame relay MIBs.

WANServant Manager is priced at $4,000, while WANServant Probe starts at $6,400. Both products are available now.

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BusinessBriefs

Ascend Communications, Inc. announced that its board has approved a two-for-one stock split payable in the form of a dividend. Stockholders will receive one additional share of Ascend stock for every share held. Upon completion of the split, about 120,000,000 common shares of Ascend stock will be outstanding.

Network Equipment Technologies, Inc. has extended a 1989 licensing agreement with Cisco Systems, Inc. to include all of Cisco's internetwork operating systems software. NET has also agreed to resell all enterprise-level Cisco internetworking products and offer users help integrating Cisco products into networks based on the NET IDNX multiservice bandwidth manager. IDNX already includes an integrated Cisco router.

Researchers at **International Data Corp. (IDC)** predicted that by this time next year, 20% of Fortune 500 companies with commercial Web sites will close or stop maintaining them.

The firm also said leading on-line information service providers, such as CompuServe, Inc., America Online, Inc., The Microsoft Network and Prodigy Services Co., will derive more than half their revenue from providing access to the Web by mid-1997 and that two of the four will struggle to survive.

IDC also predicted that on-line commerce volume will hit at least $150 billion by the year 2000 and more than $1 trillion by 2010. For more IDC prognostications, point your browser at http://www.idcresearch.com.

Alcatel Network Systems, Inc. has reached agreements to supply equipment to two major holders of personal communications services (PCS) systems – Pacific Bell Mobile Services and the Sprint Telecommunications Venture. Included in both agreements are digital microwave radios that the PCS license holders need to fulfill their obligation to relocate existing microwave users in the 2-GHz PCS band to a new 6-GHz band.

WorldCom, Inc. has acquired a 30% stake in TCL Telecom, a Dublin-based company that provides international telecommunications services to companies based in Ireland.

The transaction builds upon WorldCom's growing international presence in Europe and follows the company's acquisition of LDDS Communications, Inc. last year.

ATM net

Continued from page 17

from commercial ATM carriers.

A typical 2.4G-byte file of weather data takes 3.8 hours to transport via the T-1 network currently used by the Navy and Air Force, according to Don Drehoff. MCI senior national accounts manager. By then, the data could be obsolete due to rapidly changing conditions in the atmosphere, he said.

At T-3 speeds, the same data takes 9.2 minutes to transport. But DISA wanted each site on the net to be connected with one another, which is expensive to do with private broadband lines.

Different strokes

In addition, DISA's data transport requirements were highly asymmetrical, Drehoff noted.

For example, NOAA's communications gateway in Silver Spring, Md., is far more likely to be called on to send big caches of data to the Air Force's weather command at Nebraska's Offutt Air Force Base than vice versa.

Thus, a fully meshed private-line network would waste bandwidth in addition to being costly, Drehoff said.

By contrast, the permanent virtual circuits in MCI's HyperStream commercial ATM network are priced according to usage in megacells.

MCI officials would not reveal details, but Drehoff said the carrier won the contract partly because of what he called an aggressive bid.

Each site utilizes a ForeRunner ASX-200 BX enterprise-class ATM switch from Fore Systems, Inc. to obtain a User-Network Interface to the HyperStream backbone, currently comprising 19 ATM backbone switches from General DataComm, Inc. Local access is provided through DS3 dedicated access lines from the local exchange carrier.

Although the OC-3 capability initially will not be used across the public network, several of the sites are using an OC-3 interface between the Fore switch and the LAN backbone (see graphic, page 17).

The interface is obtained either through a Cisco Systems, Inc. 7000 router or, at the Air Force site, through the Enterprise Routing Switch, an integrated router/switch from Network Systems Corp. n

StrataCom

Continued from page 17

is to offer Asynchronous Transfer Mode Frame-based User Network Interface by the end of this quarter.

StrataCom switches support more than half the frame relay traffic in the U.S., indicating SVCs could be offered to a large number of current frame relay users, said Tom Nolle, president of CIMI Corp., a technology assessment firm in Voorhees, N.J.

The BPX switches can support "several thousand" concurrent connections, according to the company. That number actually is 5,000 per switch, less than a third of the capacity offered by some other vendors, said David Axner, president of DAX Associates, a consulting firm in Oreland, Pa.

StrataCom SVCs

StrataCom's ATM switched virtual circuit software for its BPX switch supports:

- ATM User-Network Interfaces at T-1, T-3 and OC-3.
- Interim interswitch signaling protocol for interoperability with other vendors' equipment.
- Interim local management interface for ATM connection management.

"It's a small unit," he said. "It doesn't offer too much support in one box."

But by year-end, StrataCom will push that number to 400,000 concurrent connections per switch, a spokesman said. The goal is to support millions of connections. Also coming by the end of the year is support for point-to-multipoint circuits.

Upgrades by the end of the first quarter include interfaces for inverse multiplexing, according to Andrew Greenfield, group manager of market development at StrataCom.

The new software also supports address screening, which enables users to designate by port which other network addresses that port can send to and receive from.

Also, the software is designed to ensure security for the user's traffic within a public network.

It would allow, for example, one corporate network to grant access to certain segments of its net by users on the network of another corporation with which it might be collaborating, Nolle explained.

From the carrier view, SVCs eliminate manual provisioning the alternative PVCs and load-balancing their networks, according to John Coons, an analyst with Dataquest, Inc. in San Jose, Calif. n

INTERNETWORKING MONITOR

When a part is greater than the whole

One would think that the advantages of standards would be well understood by now, but this seems to be a lesson that must be learned anew every few years.

The American Heritage Dictionary has a 10-part definition of "standard" when used as a noun and a six-part definition when used as a verb. I'm using it in the context of "a point of reference against which individuals are compared and evaluated."

I'm also specifically referring to standards that result from a fair and open process, and not vendor-produced standards or those resulting from closed consortia.

Scott Bradner

In the networking business, standards generally refer to the physical plugs used to interconnect devices or to the format of messages exchanged over a net and the actions that result when a specific message is received.

Clearly, standards benefit consumers. The fact that there are more than 100 companies making equipment that conforms to the 10Base-T Ethernet-over-twisted pair standard means that prices are low and extra features are plentiful. Since the devices must meet the 10Base-T standard, these features do not inhibit interoperability, but instead provide for increased port density, better manageability, the addition of frame switching functions and other things that may be used by the vendors to differentiate their products.

Some vendors seem to have a hard time understanding that standards also are a good thing for them. These vendors create their own technology or add proprietary extensions to standards-based technology. They think that because their product is now "better," people will buy it instead of some other product.

Over the short run, these vendors may even be right. But over the long run, 100% of a small market is not as big as just a part of a large market.

There was a handful of vendors that offered different ways to run Ethernet over twisted-pair wiring before the 10Base-T standard was adopted. Together, those vendors sold less product in a year than the amount of 10Base-T product that is now sold every few days.

The advent of standards facilitated the rapid expansion of the market. As it turned out, some of the early players did not prove to be efficient or flexible enough to compete. But those that were are now far larger than they ever would have been selling proprietary solutions.

Unfortunately, we are starting to see some of this same thinking from developers of applications for the Internet. Particularly in the area of Web browsers, vendors are starting down their own paths, sure that a pot of gold lies there.

I think this is shortsighted. The potential of commerce over the Internet will be realized when every user's browser can talk to every merchant's server. If different browsers are needed to talk to the servers of different merchants, then the merchants will have to include browser distribution in their support functions. This would be like requiring users to get telephones with different touch-tones in order to use different voice mail systems.

There are a few trillion dollars in annual business that could be done over the Internet once some of the technologies that enable secure and reliable message exchange are in place. This potential will not be even vaguely realized unless these supporting technologies become standards.

Disclaimer: Although some claim that Harvard is a standard unto itself (or at least to itself), the above opinions on the power of standards are my own.

Bradner is a consultant with Harvard University's Office of Information Technology. He can be reached via the Internet at sob@harvard.edu.

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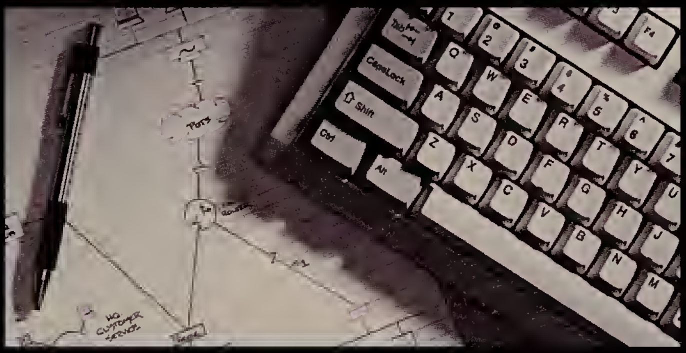

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Mobile and 'Net ships set to collide

Companies wanting to empower mobile workers with Internet access can look forward to specialized 'Net services and pricing packages from cellular carriers this year.

By Joanie Wexler

The trends toward worker mobility and reliance on the Internet are on a collision course that could finally spur big investments in wireless data services and products.

But before Internet access can become the killer application for wireless technology, today's high wireless network service prices must drop dramatically. And the industry must do something to tame wireless technology's Achilles' heel: teensy bandwidth.

Farpoint's *Mathias says carriers should offer direct 'Net access.*

The second feat will be the hardest, as wireless will "always lag wire line in speed, and basic wire-line services are already frustratingly slow for World-Wide Web browsing," pointed out Kimball Brown, director of mobile computing research at Dataquest, Inc., a consulting firm in San Jose, Calif.

But the pricing problem is easily fixed, provided that carriers are willing to bite the bullet until usage volumes rise. Leading the pricing pack is Los Gatos, Calif.-based Metricom, Inc., which last October began charging a flat monthly fee of $29.95 for its IP-based Ricochet net services, including unlimited Internet access.

The Ricochet network was a good place to start: With speeds up to 28.8K bit/sec, it comes closest to emulating what users can get over a dial-up line. However, the services are very limited in availability, concentrated mostly in northern California.

Other packet radio data network operators, such as ARDIS Co. and RAM Mobile Data, downplay using their low-speed nets (about 4K bit/sec effective throughput) for Internet access today. But the cellular carriers, whose nets can deliver about 9.6K bit/sec of throughput, are counting on 'Net services to lay the golden egg for wireless data.

They say the IP base of Cellular Digital Packet Data (CDPD) renders it a "marriage made in heaven" for Internet connectivity, as one carrier puts it, because it precludes the need for processing-intensive protocol translation between nets. But the cellular operators also acknowledge that CDPD prices, which run about 10 times those of phone lines, are a big turnoff for leisurely Web browsing.

CDPD operators charge by the volume of usage on the network, while circuit-switched cellular charges are based on the length of time connected, as with a regular phone line. This makes the different technologies more appropriate for certain 'Net applications (see story, this page).

To address the pricing hurdle, several carriers, including Ameritech Cellular Services, AT&T Wireless Services and Bell Atlantic NYNEX Mobile, this year plan to launch packages of products and services that include Internet-specific airtime pricing.

The packages will include some combination of browser software, Internet applets, portable hardware and access services from the respective wireless carrier's network into the 'Net.

Ameritech Cellular's "whole pricing structure will change when Internet services become available," driving wireless prices down for Ameritech Cellular users, said Derek Podobas, assistant director of mobile data. He acknowledged that CDPD costs "are prohibitive today" for Web browsing. Ameritech Cellular charges nearly $100 a month for 1M byte of data, which is equal to about 700 pages of text.

But in the graphics world, this allotment gets eaten up quickly when a user clicks on a home page that is graphics-intensive. That user could download thousands of kilobytes in one shot, said Craig Mathias, president of the Farpoint Group wireless consultancy in Ashland, Mass.

Jeff Damir, director of product marketing at AT&T's Wireless Data Division, estimated that CDPD rates are about an order of magnitude greater — and that circuit-switched cellular rates are about five times greater than dial-up phone rates. "No one would buy our services today to access the Internet," he said.

But Damir intends to change that. AT&T demonstrated Internet access at last fall's Comdex show in Las Vegas with a prototype phone sporting a multiple-line display. Damir indicated that the company might bundle such a device, a customized-for-wireless browser and a CDPD modem along with Internet-specific pricing.

Given that AT&T Wireless Services' parent company — AT&T — is also an Internet service provider, direct Internet access services could also be provided. This could replace having AT&T Wireless Services route users to a third-party access provider, which sends the user a separate bill. In fact, direct access services "would be a natural thing for most all cellular carriers to provide," Mathias said.

CDPD-monger Bell Atlantic NYNEX Mobile is taking a different approach. It is finding ways to make bandwidth more efficient over wireless to keep user costs at bay, rather than changing its pricing schedule.

"We have no immediate plans to offer special rates for Internet services," said Mike Franklin, director of wireless data marketing at the carrier.

Fixing the speed problem

Instead, Bell Atlantic NYNEX Mobile is testing applications from Libris, a Menlo Park, Calif., start-up developing "smart" software that lets users automatically download the text versions of graphical information. The carrier is also considering bundling wireless-savvy horizontal business applets — such as stock market services — from InfoExpress, Inc. in Los Altos, Calif., into a 'Net services package.

Similarly, "smart agents," such as those in General Magic, Inc.'s Telescript software, should help by efficiently finding the data the user wants. This would render a session less costly than when the user does the hopping from Web site to Web site.

The carriers also point out that the V.42bis compression standard for modems is bundled into the CDPD technical specification and that users should be reaping its benefits in the first or second quarter of this year. V.42bis quadruples throughput, but since CDPD users pay by volume, not by time, turning on this function would not necessarily save users any money, Damir pointed out. However, it should improve response times.

Security suggestions

Users are intrigued by wireless Internet use, and performance is one of their top concerns. But for Ameet Patel, manager of technology development at BASF Corp. in Mount Olive, N.J., security out-prioritizes performance.

The public nature of wireless airwaves and the Internet have given both a bad rap on the security front. Patel said that for his part, he is pushing carriers for what he calls "intranet" services — those by which users access their own Web site, "which is the first place the information they need resides. From there, they could access the Internet," effectively making their own firm's site the secure firewall between public and private networking. ■

FORGET P[illegible] Several universities are developing wearable mobile computers. Learn more about them on Network World Fusion. Select News+ then [illegible] Internetw[illegible].

World Fusion

Matching apps to services

Once you decide your mobile workforce needs Internet access, what type of wireless service should you choose?

Cellular Digital Packet Data (CDPD) and circuit-switched cellular services are currently your best options, experts say. This is because today's non-IP-based packet radio nets are just too slow.

When choosing between CDPD and circuit-switched cellular, get to know user traffic patterns and habits. Keep in mind these basic characteristics of CDPD and its circuit-switched sibling:

- CDPD is "connectionless;" it does not set up a fixed path through the network that you pay for as long as you are using it, so you can stay logged on to the 'Net indefinitely and incur a charge only when you send or download data. When you do move data, you pay by the kilobyte.
- Circuit-switched does nail up that path for you, which implies greater net reliability. But every time you want to do something electronically,you must redial and wait to establish a connection.

Mike Franklin, director of wireless data marketing at Bell Atlantic NYNEX Mobile, one of the most aggressive CDPD companies, recommends circuit-switched cellular for what he calls "classical World-Wide Web surfing" and file transfers. This is because it usually costs less to pay by the minute for down-loading huge files than to pay by the kilobyte.

Franklin *says once CDPD customers got the bill for Web browsing, "we'd never see them again."*

"We would be happy to provide all the CDPD-based Web browsing the user would want. But once they got the bill, that's the last we'd see of them," he said.

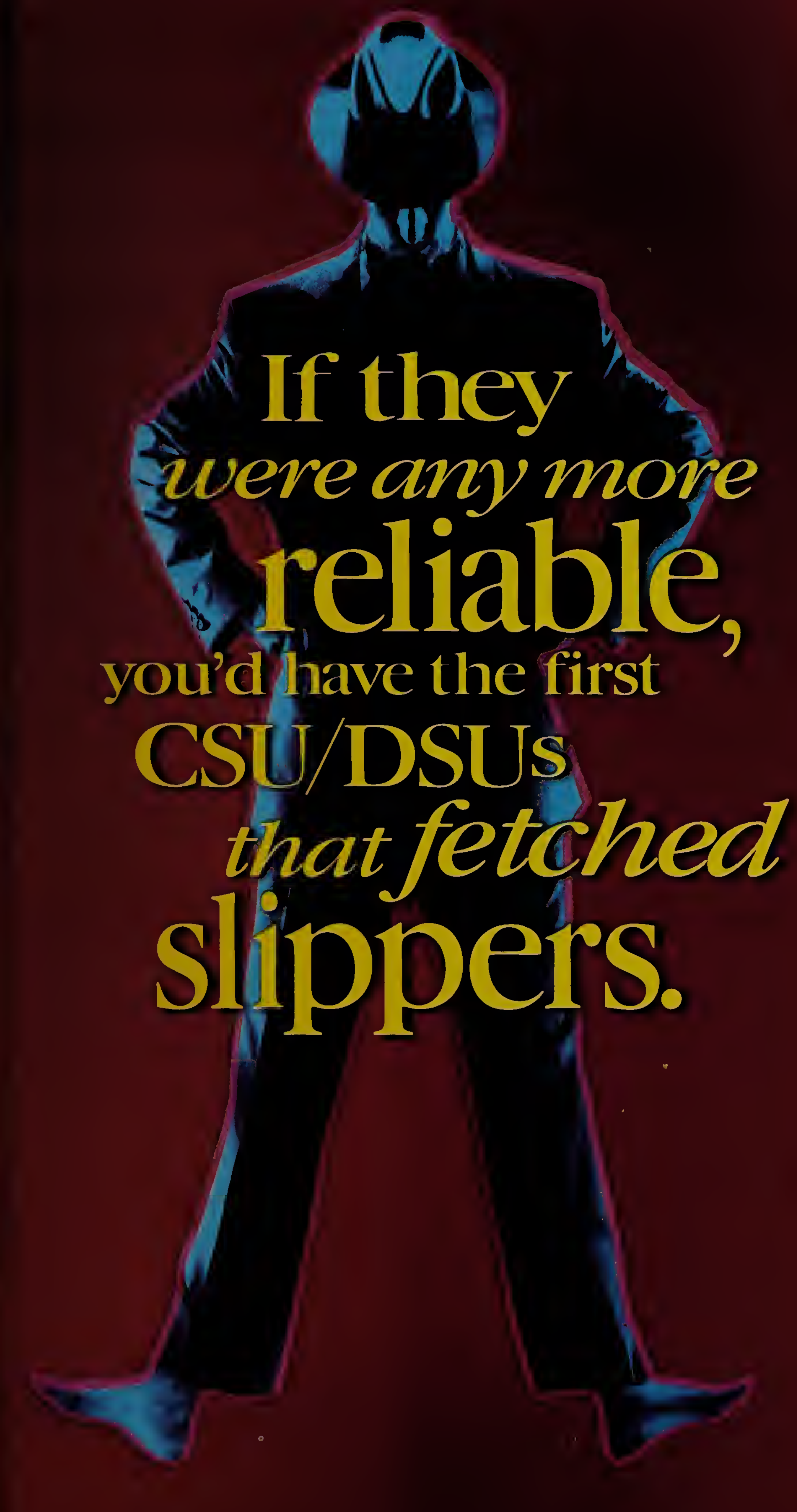
The right E-mail transport depends on message length. If the nature of your messaging is to attach lengthy files, Franklin recommends circuit-switched cellular. But short messages, like transactions, can be done faster and cheaper over CDPD, he said.

Jeff Damir, AT&T Wireless' director of data marketing, said such a transmission would cost less than 10 cents.

Some observers are skeptical of CDPD's future for certain 'Net applications. "CDPD is never going to be something you search the Web with," because of slow response times, asserted Kimball Brown, director of mobile computing research at Dataquest, Inc.

And CDPD is deployed in fewer than 30 cities today. So opting for CDPD might mean opting for no connectivity at all, depending on where workers roam.

By Joanie Wexler



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Local Networks

Covering: Operating systems • LAN management
Hubs • Switches • Adapters and other equipment

Briefs

■ **Sonic Systems, Inc.,** *a Sunnyvale, Calif.-based networking provider for Apple Computer, Inc.'s Macintosh computers, last week rolled out a new line of* **100Base-T fast Ethernet** *hubs, bridges and adapter cards that will provide users with a tenfold increase in bandwidth.*

Pricing for the 10M/100M bit/sec adapters starts at $299, and the eight-port 100Base-T FastHub is priced at $1,299.

Both will be available this month.

In addition, Sonic rolled out a two-port FastBridge, which allows users in a fast Ethernet environment to access resources shared in a 10M bit/sec Ethernet LAN. The device is priced at $899 and will ship in February.

Sonic: (408) 736-1900.

■ **Symantec Corp.** *last week announced an antivirus scanner for Windows NT that is being offered on-line free of charge.*

The software includes **virus detection** *and elimination features, as well as repair capabilities. The product is designed to scan for viruses on DOS, Windows 95 and Windows NT systems.*

The Norton Anti-Virus Scanner for Windows NT is available on the company's World-Wide Web site at http://www.semantec.com, as well as other on-line options such as CompuServe and America Online.

Symantec: (800) 441-7234.

■ **Novell, Inc.** *will announce a $17 million scholarship program this week that will enable its resellers to expand the company's base of* **Certified Novell Engineers.**

Novell this year will offer qualified partners free student kits, computer-based training courses, discount coupons for courses and coupons for skills testing.

Novell: (800) 638-9273.

New Novell R&D chief aims at 'Net

Internet pioneer Glen Ricart is hired to help build 'the network of the future.'

Q&A

It seems like every big high-tech company is looking to rule the Internet these days, and Novell, Inc. is no exception.

But when it went looking for a visionary technologist to build a research group charged with developing killer Internet applications, the company didn't turn to some young Web wizard. It hired Glen Ricart, Ph.D., one of the original net.gods. Ricart is a computer scientist formerly with the University of Maryland whose accomplishments include founding the first commercial Internet service; writing the first large-scale electronic mail application (for the National Institutes of Health); and helping to build the backbone for NSFnet, which succeeded ARPANet as the Internet's foundation.

Network World Senior Editor Kevin Fogarty recently spoke with Ricart, Novell's first corporate senior vice president of research and development, concerning what new directions lie ahead for Novell.

What is your role at Novell?

My understanding is that Novell had never planned very far out for its future. Maybe a year, maybe 18 months. My job is to establish an idea-to-product train by getting some of the brightest folks inside and outside the company to think about what the networks of the future should really look like and do, [and then to] develop prototypes. I told all [my staff] that I hope they're not here in corporate R&D in five or six years because by then, they should have had their great ideas develop into a prototype and then follow that prototype into a product group.

How do you plan to gain acceptance among the Internet community?

It's very simple. We have to take advantage of our expertise in things like directory and security and management — which are badly needed in the Internet space. At the moment, our products are marketed mostly toward existing NetWare customers. But if we can liberate some of these real strengths of Novell in the Internet area, it is going to make a big difference.

How do you sell that? By tagging those capabilities as features of NetWare? Or do you try to sell them as higher level services almost independent of NetWare?

We would like to have the best set of networking products for NetWare customers, but also for Internet customers. Do we do that by taking things like the directory and unlinking them from NetWare? Or do we do it by making the barrier to installing NetWare so small that it's insignificant and easy to adopt? We're going to take a look at those directions.

NetworkWorld Fusion more on-line
Read more of our Q&A on-line. From the main menu, select News+ then Local Networks.

What are the key Novell technologies in that area?

There are a lot of advantages in our basic networking software, down at the [NetWare Core Protocol] level, the IPX/SPX level, where there's a lot of strong authentication and security that the Internet could use. There's an opening that looks like it's almost custom-made for Novell in IP Version 6 [IPv6].

What opening?

In IPv6, there are extension headers defined for authentication and security. It was difficult for the standards committee to go too far beyond that because you need a security infrastructure behind that to do key management, distribution and the other things Novell does very well in its basic software. There's a place in the protocol where it says, 'Put your security stuff here.' It looks like our security stuff would drop right in there.

Where does Drew Major [Novell chief scientist] fit into all this? He traditionally has been Novell's visionary.

Drew is advanced NetWare. He neatly fills the gap between what the product groups are working on for the next release and where I am about two to three years out.

What's your evaluation of Novell and its products?

My initial take is that there is a very strong set of products here that is being ignored. And I have to admit that I was trying to

See **R&D chief,** *page 29*

UB rolls out its first fast Ethernet products

By Jodi Cohen
Santa Clara, Calif.

UB Networks, Inc. last week rolled out its first line of fast Ethernet products, which will allow customers to boost by 10 times the bandwidth of their 10M bit/sec Ethernet networks.

The 100M bit/sec products — two new fast Ethernet hubs, a 10M/100M bit/sec Ethernet switch and fast Ethernet adapters — are welcome news for many UB customers. UB rivals, such as 3Com Corp., Bay Networks, Inc. and Cabletron Systems, Inc., all unveiled fast Ethernet products last year.

Virgil Palmer, manager of computing and telecommunications infrastructure services at Air Products and Chemicals, Inc. in Allentown, Pa., plans to evaluate UB's 100Base-T devices to alleviate congestion within server farms.

"Fast Ethernet would help us better manage the applications that are being added to the network and the growing number of users demanding access to these services," he said.

The GeoStax/FE is a 12-port 100Base-T workgroup hub that can be stacked up to five units high. The hub is available in 100Base-TX configurations for newer Category 5 unshielded twisted-pair (UTP) wiring, as well as 100Base-T4, designed for more common Category 3 or 4 UTP cable. The hub provides dual power supplies and optional Remote Monitoring capabilities.

UB also rolled out the GeoStax/FE Micro, a little brother to the GeoStax/FE. The unmanaged hub provides eight 100M bit/sec desktop links.

In addition, UB enhanced its existing GeoRim/E switch with a 100Base-T uplink module.

The GeoRim/E 10M/100M bit/sec Ethernet switch — designed for workgroups and small backbones — offers 12 10Base-T ports as well as the 100Base-T uplink. The new switch module allows integration of 100Base-T and 10Base-T LANs. UB also announced that it is shipping 100M bit/sec adapter cards for both EISA- and PCI-based machines.

Pricing for the GeoStax/FE hub starts at $2,995, while the GeoStax/FE Micro costs $1,795.

The GeoRim 10M/100M bit/sec Ethernet switch is priced at $7,690, and the adapters start at $164. All products are available now.

©UB: (800) 777-4526.

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Product	Description	Price
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GeoStax/FE	12-port 100M bit/sec managed hub	$3,995
GeoStax/FE Micro	8-port 100M bit/sec unmanaged hub	$1,795
GeoRim/E 10/100	12-port Ethernet switch with 100Base-T uplink	$7,690
Fast Ethernet adapters	Adapter cards that support PCI and EISA buses	Starts at $164

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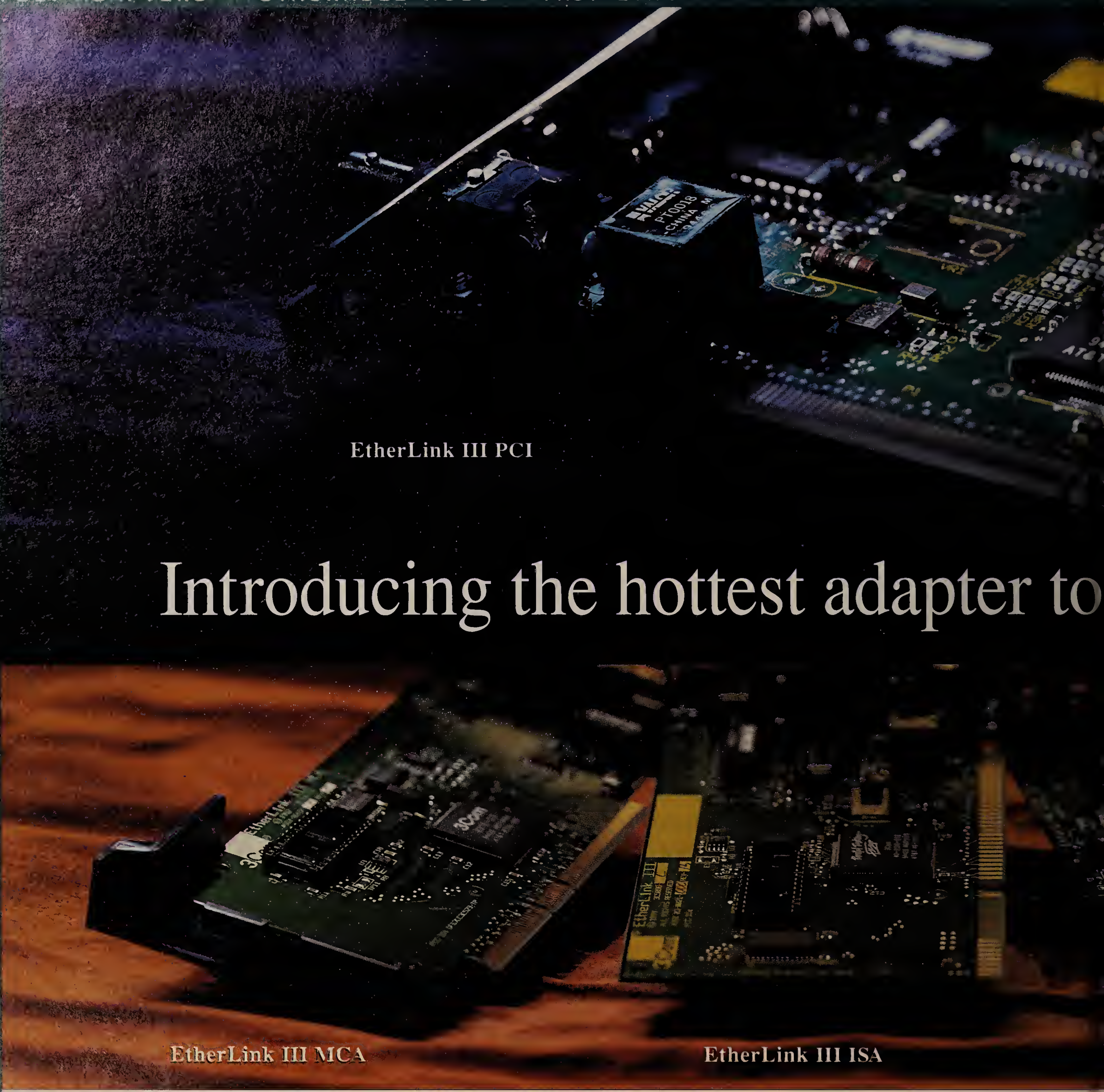

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WIRED WINDOWS

Mismatched WinSocks are not fashionable

One of the worst nightmares for a salesman is showing up at a client's site with mismatched socks — one blue, one brown. Now a variant of this situation — mismatched WinSocks — could become a nightmare for you as a network administrator, especially if you are installing Windows 95.

Dave Kearns

The Windows Sockets (WinSock) API is a specification put together by Microsoft Corp. and FTP Software, Inc. that lets a Windows application programmer write software regardless of the TCP/IP driver stack implemented on the PC.

Before WinSock, programmers had to write directly to the TCP/IP driver, which meant writing multiple versions for different driver stacks or limiting yourself to one or two popular ones. The WinSock spec changed all that because the driver stack vendor supplied a specific WinSock.dll library, which accepted the standard calls from the application and translated them for its TCP/IP implementation.

Under Windows 3.1 and 3.11, this led to a vast proliferation of Internet access applications and was a major reason for the quick rise in popularity of Web browsing.

The very popularity of Web browsing, though, has led to the mismatched WinSocks problem. One problem is that end users have begun installing WinSock.dll libraries on their own that only work with dial-up links and that overwrite corporate-standard WinSock.dll libraries intended to work over a LAN.

Most LAN sites with 'Net access use a packet driver-style TCP/IP stack or an Open Datalink Interface stack from Novell, Inc., NetManage, Inc. or another provider. But when net administrators in these environments put what end users saw as limitations on their Internet access rights, many end users jumped at the chance to add 'Net access to their on-line service accounts. Administrators learned that Internet access applications offered via these services could overwrite the company-standard WinSock.dll.

Windows 95 takes the confusion to a new level. Not only can the user install another WinSock.dll for Internet access through The Microsoft Network or any other dial-up provider, but as a 32-bit operating system supporting 32-bit applications, Windows 95 has a 32-bit WinSock.dll.

That's no problem if you're running all 16-bit applications — they'll run with either your original 16-bit WinSock.dll or the 32-bit version. But Microsoft's Internet Explorer and Netscape Communications Corp.'s Navigator 2.0 are 32-bit programs and won't run in your 16-bit WinSock environment. That means more frantic phone calls from end users and more visits to their desktops.

In a future column, we'll explore the Windows 95 Policy Editor as well as the operating system's remote policy management capability — a great tool to eliminate many of your physical visits to end-user desktops. For now, the important thing to keep in mind is the search order that Windows 95 and other Windows applications use when attempting to open a program or library file.

Applications should first search the directory they're loaded from, then the directory Windows loads from and finally the System directory under the Windows directory, only if the file has not been found. By storing the proper WinSock.dll in the same directory as the application that's using it, many of the mismatched WinSock problems are avoided and users can freely move back and forth between 16- and 32-bit programs.

Kearns is a former network administrator and now is a freelance writer and consultant in Austin, Texas. He can be reached at dkearns@msn.com.

Tip of the week

All network administrators with Windows 95 on their network should access **http://www.microsoft.com/windows/software/mspwlupd.htm** *and obtain the password update. The algorithm used to encrypt passwords by Windows 95 as shipped is easily cracked.*

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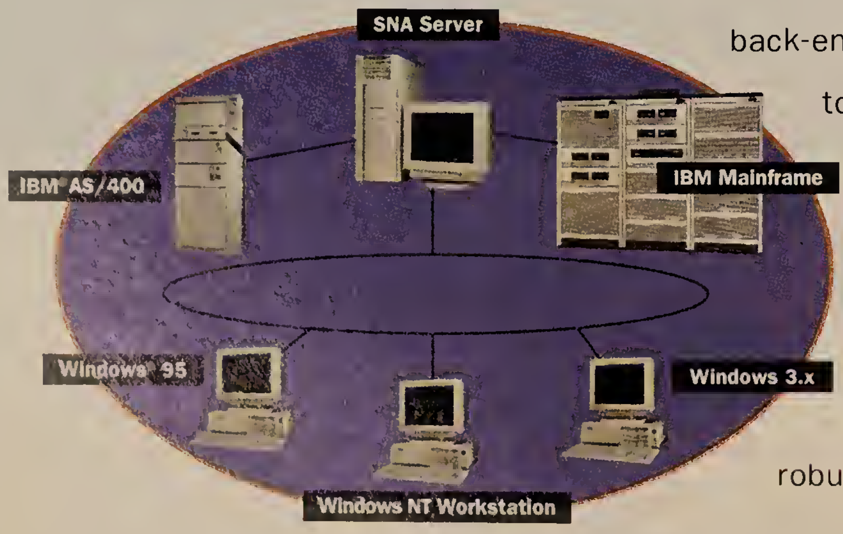

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R&D chief

Continued from page 25

ignore them when I was on the other side of this because of the fact that they're viewed as proprietary.

The important thing to do is take the software base that we have and turn it loose in the open networking world.

How do you mean that?

For a long time, we've written programs to computers. You write to Windows or to the MacOS. It's now fairly widely agreed that new programs are going to instead be written to the network. And Novell has an especially strong lead in that field with the Net2000 APIs and specifications.

But Net2000 is a proprietary set of APIs that addresses a single operating system.

We will fail if that's what it ends up being. I have every confidence that it will be an open and accepted set of APIs. The acid test is: Will other people develop for these APIs? Will we have competition in this space? ■

NET RESULTS

Fore is proving to be a smart shopper

Amidst the year-end, holiday buying frenzy you might have missed the latest network industry shopping extravaganza: Fore Systems, Inc.'s agreement to buy Alantec Corp.

Fore became somewhat of a "shopaholic" in 1995, announcing deals to buy four different firms. But the stock transaction for Alantec, valued at about $700 million, is by far its most ambitious move.

This deal takes Fore out of the Asynchronous Transfer Mode niche, allowing the company to branch into more traditional LAN switching and routing, as well as to provide a reasonable migration path to ATM backbones. Fore made a good move, and here are some of the reasons why.

Skip MacAskill and Melinda Le Baron

Where have all the routers gone?

Alantec has one of the few viable router software stacks left in the industry. If you have been paying attention, you know there are few router vendors left. The major router vendors are obvious, and the minor ones are either disappearing, selling their code or being snapped up by larger vendors that need the technology. Alantec has proven that its router stack works and can interoperate with other vendors' routing technology.

I have more ASICs than you have . . .

Many industry pundits have knocked Alantec for a lack of switching-specific hardware, including its minimal ASIC-based switching technology. However, those pundits overlook that Alantec's PowerHub line was designed to both route and switch traffic, which means that if it had all of its hardware dedicated to switching, it would make a really bad router.

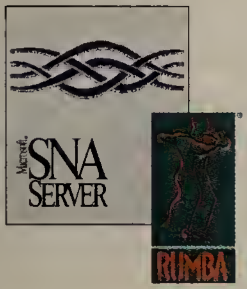
By using a combination of off-the-shelf components and ASICs, Alantec has developed a high-performance traffic-forwarding platform. If routing is not needed, then it may not be the best switching option. But we have seen too many instances of dysfunctional "flat earth" switched networks to count out that need for routing.

Routing over ATM: Clash of the vendors

There is much cloak and dagger these days surrounding the networking vendors and the ATM Forum — especially where it concerns some of the most intriguing technologies, such as Multiprotocol over ATM. Or is that Integrated Private Network-to-Network Interface . . . or is that edge routing? Secret meetings, consolidated vendor camps and misinformation campaigns are alive and well, and potentially slowing down the progress of standards and implementations. To have a working solution for routing legacy LAN data and protocols over ATM, Alantec has already integrated Fore technology — both standard and nonstandard — into its PowerHub line. This enables the devices to be used as edge routers. Does it work? Yes. Will it be the ultimate solution for routing legacy LAN data and protocols over ATM? We doubt it. But it is a solid solution and provides a basis for upgrading.

Of course, there are more good reasons why this is a smart move by Fore. But we hammered on those issues enough last year.

Le Baron is a research director and MacAskill a senior research analyst in Gartner Group, Inc.'s Network Computing Infrastructure group. They can be reached by E-mail at inquiry@gartner.com or by phone at (203) 316-1111.



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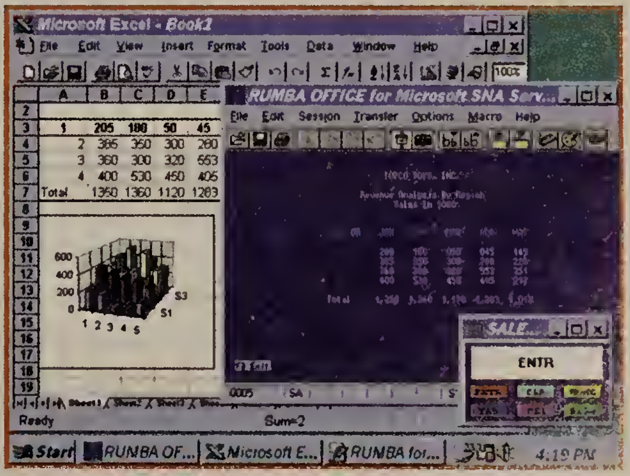

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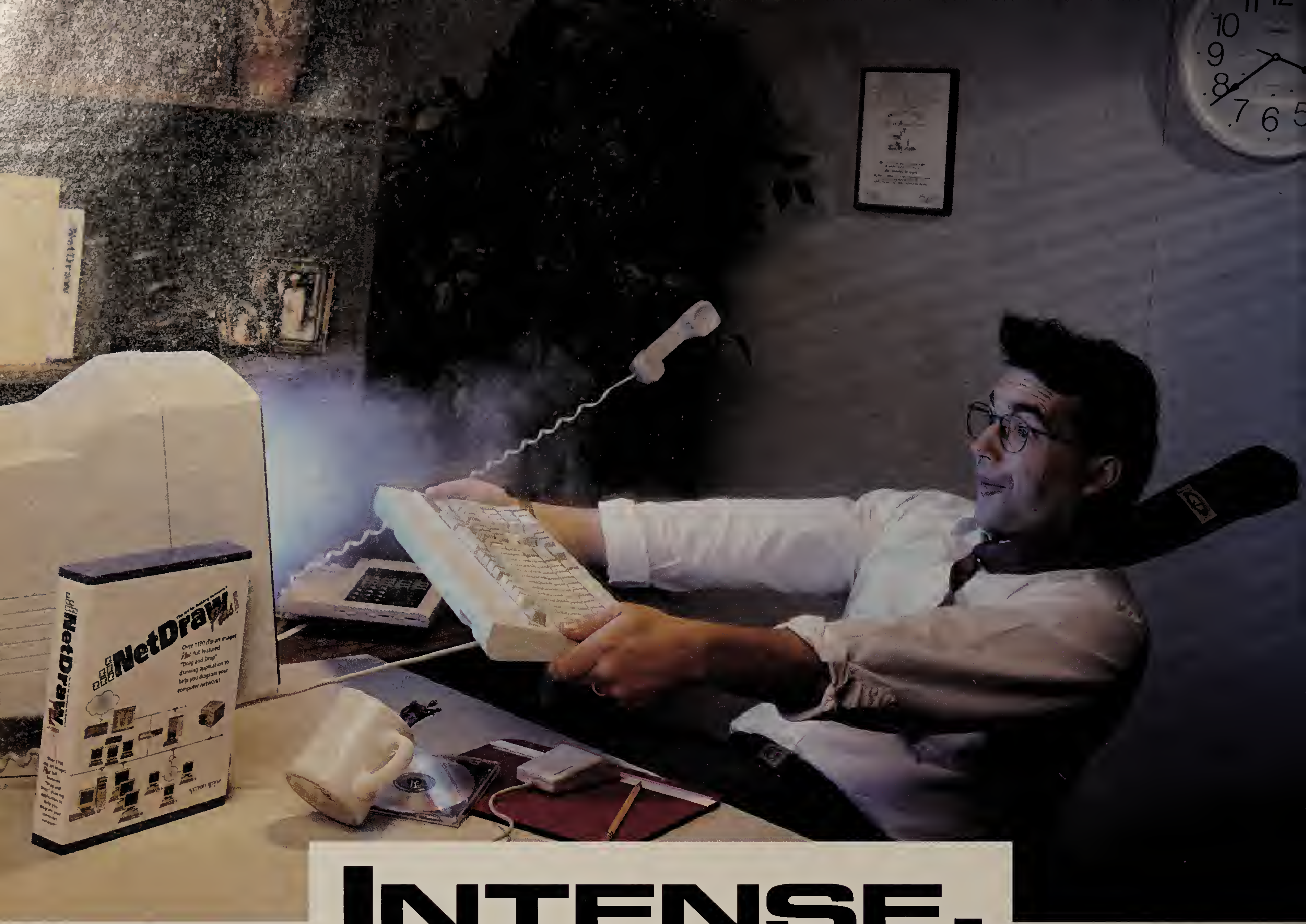

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Client/Server Applications

Covering: Databases • Messaging • Groupware
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Briefs

■ **Automatic Data Processing, Inc. (ADP)** *and* **SAP America, Inc.** *last week announced plans to develop an interface between SAP's R/3 client/server applications and ADP's payroll outsourcing services.*

In addition to payroll processing, the interface will let SAP users access other ADP services, including tax filing, direct deposit and unemployment cost management.

■ **Andyne Computing, Ltd.** *has begun shipping Query Management Option, scheduling and management software for controlling* **database queries** *that works with the company's GQL graphical query tool. Query Management Option lets users specify when they would like a query to run, manage the execution of queries to regulate database load and submit queries for processing at a later time.*

The software runs on Windows and Macintosh systems and costs $199 per user. GQL costs $695 per user.

Andyne: (613) 548-4355.

■ **Cimage Enterprise Systems, Ltd.** *last week announced Universal View, a component for its ImageMaster* **document management software** *that can be used to view and print files from various word processors, spreadsheets and other applications.*

ImageMaster costs $595 per user, and Universal View is an additional $75 per user.

Cimage: (714) 753-0272.

■ **Lotus Development Corp.** *last week announced that* **Notes Release 4** *will begin shipping on Jan. 10, in time for Lotusphere '96 to be held Jan. 22-25 in Orlando. The groupware product went into manufacturing on Dec. 29, according to the Cambridge, Mass., company.*

Release 4 originally had been scheduled to ship by the end of the year.

IBM to put on a Taligent show

Will blend CommonPoint Application Software with its Open Class and VisualAge tools.

By John Cox

IBM will take its first step to energize the former Taligent, Inc. application development system next month when it begins blending key parts of the technology with existing IBM C++ application development tools.

Taligent, launched by IBM and Apple Computer, Inc. in 1992 as a separate development company, became an IBM subsidiary last month after assorted starts and stops on its way to building an advanced application development environment.

IBM's intent is to introduce Taligent's CommonPoint Application System to corporate developers as quickly as possible. IBM hopes to speed the introduction by making use of readily available tools, such as its Open Class C++ class libraries.

Later this year, IBM will integrate Taligent technology with VisualAge, IBM's graphical development environment for C++ and other languages.

The combined technologies of Taligent and IBM should make it easier for corporate developers to build sophisticated distributed applications, said Jon Slitz, IBM's vice president of marketing for object technologies.

The right framework

CommonPoint frameworks are object-oriented collections of related and integrated application functions, covering everything from opening windows to accessing a corporate database. The frameworks give developers a coherent set of reusable functions for building applications quickly.

"Using the [CommonPoint] frameworks gives you leading-edge application development," Slitz said. "Then, taking these and combining them with C++ gives you the power to incrementally improve existing development with the well-understood techniques of class libraries."

"It's clear to us that the Taligent frameworks developed so far are the most far-reaching in breadth and depth of any object frameworks or class libraries that have yet come to market," said Ron Lang, a partner at Catalyst Solutions, Inc., a Los Altos, Calif.-based object technology consulting firm and a Taligent business partner. "Once customers get past the learning curve, they will be able to build applications with incredibly higher functionality in much less time [than with conventional C++ tools]."

As an IBM development center, Taligent will be responsible for all CommonPoint development, including porting CommonPoint to Windows NT and Windows 95. IBM will take over all marketing and related tasks.

IBM's plan is pragmatic, according to Hugh Bishop, director of emerging technology research at Aberdeen Group, Inc., a Boston-based consultancy.

"They're providing a common frame of reference [for customers]," he said. "They're going in and saying, 'You've already got VisualAge [or Open Class], and here's something that makes it better.' "

Beta users and partners had mixed responses.

"I remain optimistic," Catalyst's Lang said. "CommonPoint holds a lot of promise for the corporate software development market. At least now there won't be any confusion about which company we're trying to get work done for."

But Randell Flint, president of Sundial Systems Corp., a Seal Beach, Calif., vendor of calendaring and time management applications, and a CommonPoint beta user, said the company is reevaluating its commitment to CommonPoint. "If, in its present form, it won't be on Apple and HP operating systems, then it clearly won't be the cross-platform technology we thought it would be."

CommonPoint for OS/2 was released Dec. 15, joining the AIX version released last July. IBM "wants to support Windows to the same level we support OS/2 and AIX," Slitz said. However, no dates have been announced for the Windows versions. ■

Taligent's long and twisting tale

Late 1980s – Apple starts developing object-oriented operating system, called Pink.

October 1991 – Apple and IBM outline plan to use Pink as basis for joint development of system software and tools for PowerPC and other processors.

Early 1992 – Apple and IBM launch Taligent as separate development company.

Mid-1993 – Taligent cancels operating system work, refocuses on integrated, C++ frameworks to be used in building collaborative applications that run on multiple operating systems.

January 1994 – HP becomes third Taligent investor.

Spring 1995 – Beta release of renamed CommonPoint Application System ships.

Summer 1995 – CommonPoint ships to investors and IBM ships CommonPoint on AIX.

December 1995 – IBM ships CommonPoint on OS/2. Taligent becomes an IBM subsidiary, charged with continuing development of CommonPoint; Apple and HP retain licensing rights.

Industry consolidation

Informix nabs Illustra for Web software

By Barb Cole
Menlo Park, Calif.

Informix Software, Inc.'s acquisition last month of Illustra Information Technologies, Inc. could help the database giant better support the next wave of networked applications, including those supporting the World-Wide Web and multiple data types.

The deal, valued at about $400 million, stunned many observers, given that Illustra was unprofitable last year with estimated revenues of less than $10 million. The company's Illustra Server is an object/relational database capable of handling data, audio, video and images.

What sweetened the deal for Informix was a software module from Illustra that works with Illustra Server and is designed to deploy database applications on the Web, observers said.

"The market opportunity on the Web is occurring more rapidly than any of us expected," said Phil White, Informix chief executive officer. Informix rivals Oracle Corp. and Sybase, Inc. have recently announced tools for integrating their database offerings with the Web.

Informix plans to integrate its flagship OnLine database with Illustra Server to support Web applications, White said. In the interim, Informix will deliver by year-end a tool for building applications that work with both the Informix and Illustra Server.

"This area of complex data types is going to be the next battleground for database vendors," said Sanjeev Varma, an analyst at Gartner Group, Inc. in Santa Clara, Calif. "This bold move positions Informix well for the World-Wide Web market."

Users were also enthusiastic about the deal's potential.

"We'd like to let guests look at rooms and room views via the Internet, so this sounds like something we'll be able to take advantage of," said Gary Tomson, vice president of information technology at Choice Hotels International, Inc., a hotel chain in Silver Spring, Md., that has a Web-based reservation application running on Informix's database. ■

Find more info on-line, including:

- ▶ **Details of Informix's Universal Server plan.**
- ▶ **Articles on Web efforts by other database vendors.**
- ▶ **Links to software for creating your own Web databases.**

From the main menu, select
NetworkWorld Fusion **News+ then Client/Server Applications.**

SHARED LOGIC

Mike Rothman

Can POP mail stay on top?

This holiday, I headed down south to find unseasonably cold temperatures and visit my family. The weather had little effect on my lousy golf game, but my fiancee's plans for tanning weren't so successful.

As an added bonus, I got to spend some time with my grandparents and realized the Post Office Protocol (POP) mail craze can probably be put in perspective by comparing it to another type of POP — as in GrandPOP.

The first major similarity is age. TCP/IP mail derivatives such as POP and the Simple Mail Transfer Protocol have been around for years, as has my grandfather, who will be 90 this spring. As things get older in the technology world, you expect them to mature and evolve. POP mail has done exactly that, but much more slowly than proprietary LAN-based mail systems, such as cc:Mail and Microsoft Mail.

That brings us to the next similarity: a lack of functionality. Nothing against dear old Popie, but he's not what he used to be. I need to use a megaphone to overcome his auditory challenges, and he doesn't get around as quickly as he used to.

POP mail has similar functionality issues. Although large strides have been made over the past year, POP mail offerings are just not functionally on par with LAN mail systems. Furthermore, the interface is not as pretty as the newer, younger models. Another sign of aging.

Reliability is also in question. POP mail has no facilities to track messages or even centrally manage mailboxes. Similarly, my grandfather just cannot remember everything we tell him, so we must show some patience and repeat ourselves. For some reason, I don't think business end users will be as considerate if one of their important presentations or sales forecast happens to be forgotten.

Lastly, there is the question of long-term viability. Clearly, in the case of my grandfather, the picture is not good. No one lives forever and he will be no exception, so all we can do is be thankful for every day he stays around.

Is this the case with POP mail? Is it destined to wrinkle up, move to Florida and try to enjoy the twilight of life? Or will some magical fountain of youth elixir appear to fade away the age and enable it to begin anew?

I'd say POP mail will find a nice niche over the next two years. Folks like Network Computing Devices (NCD), Siren Software, Netscape Communications Corp. and others are doing a fine job of updating the interface. With a new snazzy GUI, you may not miss your old cc:Mail.

Yet I don't expect a great expansion of functionality in the short term. As traditional LAN mail vendors now concentrate on building groupware and other value-adds into the product, POP mail will be the poor, old stepsister for the foreseeable future.

On the back end, we can look forward to a bundling of POP mail clients with more robust message stores. The usual culprit is Software.Com, whose Post.Office is the core engine underneath Netscape's and NCD's pending server offerings, and adds more reliability, security and manageability. NCD is also trying its hand at a directory service, which is a key need.

Internet mania will continue to drive investments in technology to make POP a reasonable mail system for the next few years. Now what is really needed is some breakthrough to fight aging, which I think we all could use.

Rothman is a vice president in META Group's Global Networking Strategies service in Reston, Va. Feedback is welcome either by E-mail at miker@metagroup.com or by phone at (703) 860-6600.

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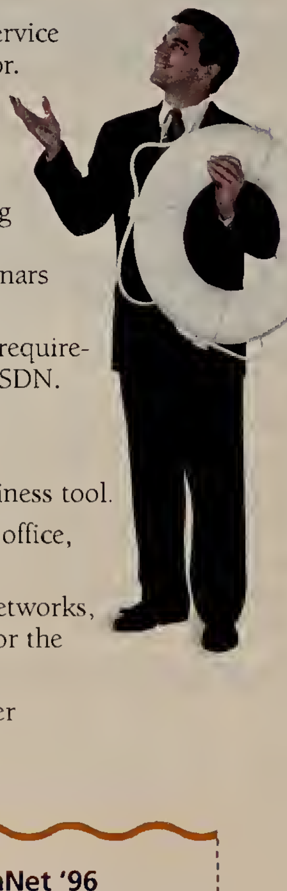

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Briefs

■ *Florist* **1-800-FLOWERS** *has* **overhauled its 9-month-old Web sales site** *at www.800flowers.com. The company added images of a colorful garden with horticultural and decorating information.*

■ *Cambridge, Mass.-based start-up* **Object Power, Inc.** *has released OpenScape, a Visual Basic-like programming environment for building* **interactive applications** *on Web sites.*
Object Power: (617) 876-2338.

■ **NetCarta Corp.** *this month will release WebMapper, a set of* **management and navigation** *tools that help corporate Webmasters maintain, analyze and construct their Web sites.*
NetCarta: (408) 461-8920.

■ **Infonet Software Solutions, Inc.** *has added a* **message archiving** *feature to its Message 400 mail product to support the U.S. government's mandate for archiving electronic documents. The feature lets agencies preserve important electronic mail.*
Infonet Software Solutions: (604) 436-2922.

■ *RAD Group, Inc. subsidiary* **RADLINX, Inc.** *has developed a $950* **fax device** *that allows fax traffic to be sent via the Internet or over a private IP network. PassAFax PF-1, which sits on an Ethernet LAN and converts standard Group III fax data into IP packets, is available now.*
RADLINX: (201) 529-1100.

■ **Microsoft Corp.** *has picked up some early adopters of its* **Internet Server Application Programming Interface (ISAPI).** *Process Software Corp. of Framingham, Mass., implemented the standard in its Purveyor WebServers. Nomad Development Corp. of Seattle supports ISAPI in its WebDBC 2.5, a Web server-to-database development link now in beta test.*

Web publishing tools christen the new year

Software lets publishers convert multiple formats to HTML.

By Ellen Messmer

The new year has already brought a wave of electronic publishing software adapted to work on the World-Wide Web.

The software is not just for simple documents. This month, Electronic Book Technologies, Inc.'s (EBT) Carberry Technology division will ship a Web version of its CADLeaf CAD/CAM software.

The DynaWeb server software comes with a viewer client, dubbed FIGLeaf Inline, that lets users pan and zoom in on both raster and vector graphics on the Web.

With DynaWeb, Web publishers can maintain the same graphics formats they used with EBT's DynaText SGML-based publishing software for CD-ROM. DynaWeb converts DynaText electronic books to HTML.

FIGLeaf Inline, a client "plug-in" module for Netscape Communications Corp.'s Navigator 2.0 browser, supports Computer Graphics Metafile vector graphics as well as 12 other formats.

"The plug-in for the Netscape Navigator will be available in February, and we're also working on one for Microsoft's Explorer," said Patrick Carberry, the EBT division's president.

Pricing for the publishing suite has not been set, he added.

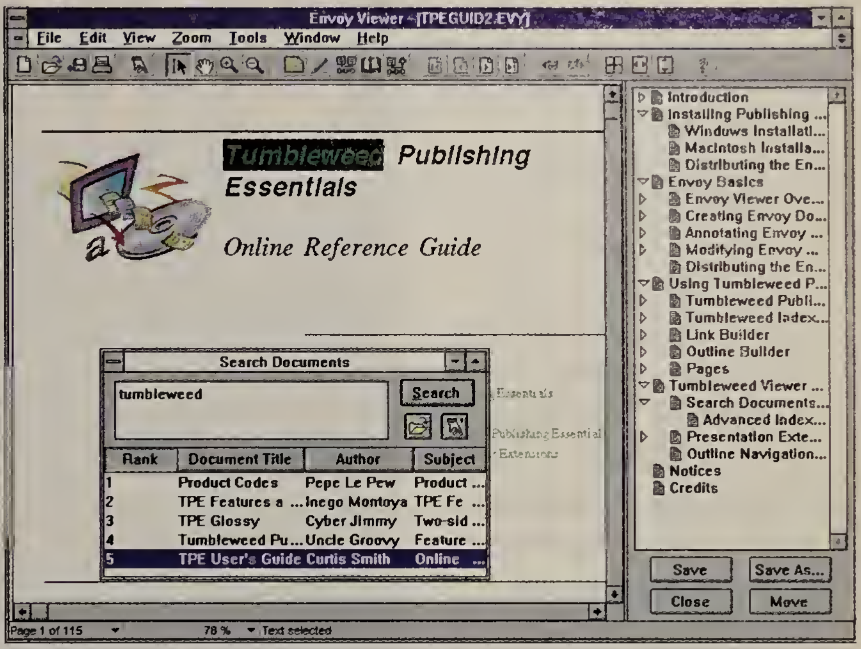
Tumbleweed Software Corp., which developed the Envoy portable document publishing technology sold to WordPerfect and later acquired by Novell, Inc., also has its eye on Web publishing.

For publishers who need to convert multiple document formats — such as PostScript, PageMaker and Adobe Acrobat — to HTML, Tumbleweed has created conversion tools and search engines that let publishers make text and graphics on the Web using Envoy.

"We're employing the Netscape 2.0 plug-in architecture which allows you to view Envoy documents [with] the Netscape browser," said Mark Pastore, Tumbleweed's chief operating officer. "It looks just like an HTML document."

Tumbleweed also is working on a Web plug-in for Microsoft's Explorer. While the Envoy viewer will be distributed for free, Tumbleweed's full-text retrieval search engine will cost $5,000 per company for unlimited use.

Electronic Book Technologies: (401) 421-9550; Tumbleweed: (415) 363-7024. ■



Tumbleweed Publishing Essentials

Online Reference Guide

tumbleweed

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2	TPE Features a ...	Inego Montoya	TPE Fe ...
3	TPE Glossy	Cyber Jimmy	Two-sid ...
4	Tumbleweed Pu...	Uncle Groovy	Feature ...
5	TPE User's Guide	Curtis Smith	Online ...

Tumbleweed *is tackling the Web with conversion tools and search engines.*

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BUSINESS SPACE

Sober Internet product vendors?

Do you feel kind of rung out? Is going back to work actually a relief? Then you, my friend, have hit the Holiday Barrier.

The Holiday Barrier is the point at which you say, "Enough! I need a normal life; please don't entertain me anymore."

Mark Gibbs

Here at das Schloss Von Gibbs, we have had seven parties since Thanksgiving.

One thing I noted was a curious affliction of our more inebriated guests: repetition. After a number of drinks that varied in scale rather widely (from glasses of chardonnay to bottles), conversations got a disturbingly cyclic quality.

My first reaction was that I might be living through one of those episodes of *The Outer Limits* or that movie *Groundhog Day*, where someone has to repeatedly relive the same day. I then realized how like the Internet market the affliction was.

Just consider the infrastructure level. What do you hear? "Our router/ATM switch/(fill in the piece of equipment as required) does (fill in this blank, too)." Talk to one infrastructure vendor and you've talked to them all.

What about transport-layer vendors? They all steal each other's promo material. "Our stack does x, y, and z." So what? So does everyone else's.

And even at the top of the communications model, it's the same. Microsoft's browser does this, Netscape's does that. Oracle's does this and that.

Sadly, like drunks everywhere, the boasting impulse also comes into play. I mean, is there really a browser out there that is fully featured *and* stable? Netscape Navigator Version 2.0b3, which I like in spite of its fragile health, brings a new spin to random failure. Yet their PR material brags and brags.

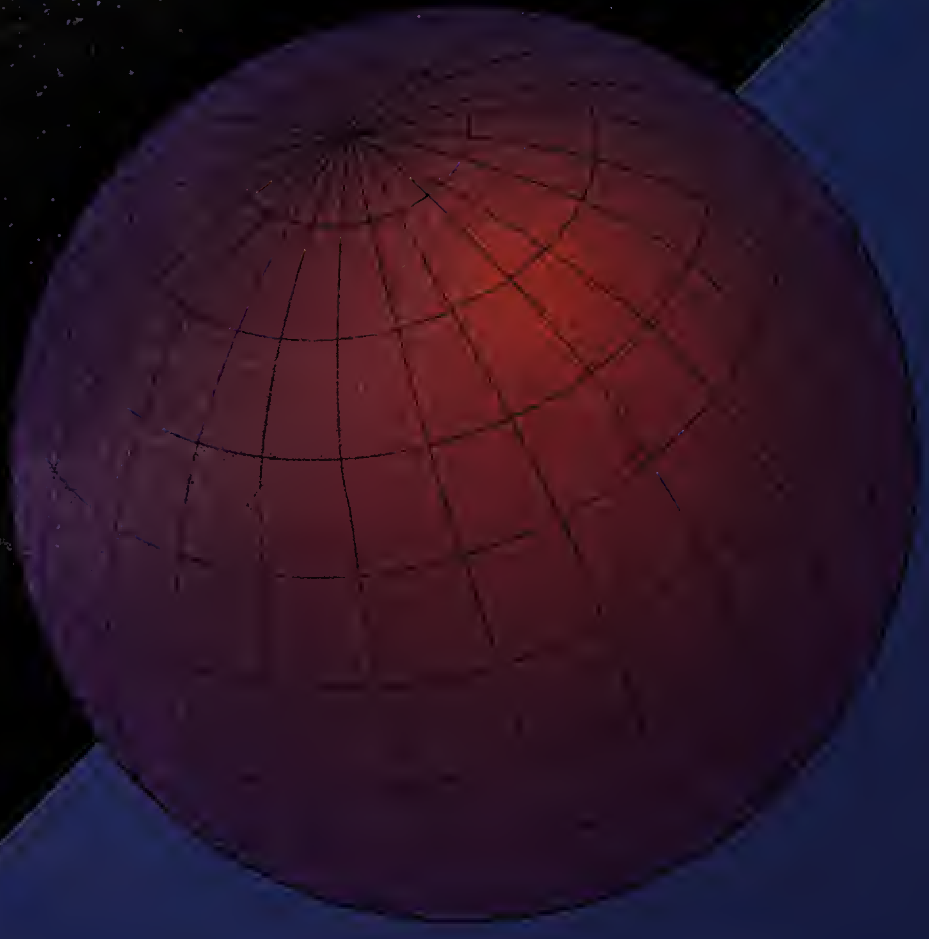
So here's a test we developed at the Gibbs Clinic for Pathological Marketing to assess market sobriety quotients for Internet product vendors: (Score 3 points for a yes, 2 for a maybe and 1 for a no.)

1. Do they tell you something that sounds suspiciously like the same glowing, rosy product pitch story with every release?
2. Is that story more or less the same as everybody else's?
3. Do they keep releasing beta products billed as having exactly the features you can't live without but that only work if you sacrifice small mammals?
4. Would you like to run amok in their marketing department with a blunt spoon?
5. Is their product unstable within minutes of use?
6. Do they try to deny the bugs in their products actually exist and keep claiming that it runs fine under Windows 95 with four megs of RAM?
7. Do they announce a new strategic relationship every week?
8. Do you find it increasingly hard to understand what your vendor is actually doing?

If your vendor scored less than 7, you need remedial help with counting. If they scored an 8, let me know who this sober paragon is. If they scored 9 to 16, they are just slightly inebriated.

If your vendor scored 17 or above, they are just another one of the marketing drunks out there. Take away their virtual car keys. Remember, customers don't let vendors market drunk.

Happy New Year. Let me know if you had a good Christmas at mgibbs@gibbs.com, or call me at (800) 622-1108, Ext. 504.



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Some of our Novell, Inc. NetWare 3.12 users have been experiencing insufficient memory errors from their workstations – even with 24M bytes of memory and no open applications. What gives?

C. Kratz, University of Pennsylvania

Verify that you have the latest network interface card drivers loaded on your server, says Ron Nutter, a Master Certified Novell Engineer in Lexington, Ky. Then make sure you are using the latest hard-disk controller driver — in your case, ide.dsk instead of idadisk.dsk.

Also, update the clib.nlm on the server. Load all appropriate patches obtainable from CompuServe, Inc.'s NetWire forum. If the server motherboard has an external processor cache, disable it.

If the problem persists, try swapping out the network cards in the server. Also, confirm that your cache buffer is above 60% by checking the monitor.nlm. If it is below 60%, try adding more memory to the server. In addition, check all third-party NetWare Loadable Modules to make sure they are the latest releases.

If you still have no luck, compare the configuration of workstations with the problem against those without it. Also, try loading another copy of Windows to a different workstation directory. If you use NETX to access the server, download the latest version of it from CompuServe.

Then, check with your network card manufacturer to verify that your workstations have the latest driver. You might also try migrating one workstation to the newer Virtual Loadable Module technology. You can even try swapping out the network card from the problem workstations.

Where can I learn more about Novell, Inc.'s NetWare Core Protocol?

Jerry Sadofsky, via the Internet

Try reading *Novell's Guide to NetWare LAN Analysis, Second Edition* (Novell Press) by Laura Chappell and Dan Hakes. It retails for $44.99.

AIW pushes HPR access into ATM fast lane

By Marcia Peters and Chuck Brotman

Since class of service makes 21 years of SNA applications Asynchronous Transfer Mode-ready, the APPN Implementers Workshop (AIW) naturally has begun work to connect them to ATM networks.

While agreeing on LAN Emulation (LANE) as a good interim step, the AIW recently endorsed High Performance Routing (HPR) as SNA's preferred ATM access method. It believes HPR offers several distinct technical advantages.

HPR, culminating three generations of SNA, enhances second-generation Advanced Peer-to-Peer Networking. It was standardized last spring by the AIW, a 41-vendor consortium. HPR is available on three IBM platforms and is expected soon on additional IBM systems and from Bay Networks, Inc., Cisco Systems, Inc., 3Com Corp. and other AIW member companies.

Last November, the AIW approved a first draft on the requirements and proposed solution for HPR native access to ATM. A second draft, expected this March, should have enough detail that vendors can start writing software. Final approval is expected in July.

Passing LANE

ATM Forum-standardized and AIW-backed LANE technology provides a good solution until HPR is widely used. The AIW agreed that HPR native access is the only other approach needed. LANE uses unspecified-bit-rate (UBR) ATM — the best-effort service that has no quality-of-service (QoS) guarantees — to bridge between applications on LAN- and ATM-attached computers. Multiple users share a single circuit with no prioritization.

In contrast, HPR exploits many ATM services. For time-critical transactions, it can allocate bandwidth-reserved variable-bit-rate connections with controlled delay and error rates. Or, for batch file transfers, it can choose a less predictable, cheaper UBR service.

By exposing class of service at its application program interface, SNA lets HPR match ATM circuit properties to each application's needs. HPR then provides ATM signaling information.

The AIW endorses LANE as a great start for applications without demanding QoS requirements. But it believes HPR provides a better way to map between SNA class-of-service and ATM QoS features or to support speeds over 100M bit/sec.

What's more, APPN's connection network technology already provides what the ATM Forum's Multiprotocol Over ATM (MPOA) subworking group calls zero-hop routing — the Holy Grail of LAN switching without routing. IP and Novell, Inc.'s IPX needed zero-hop routing to overcome their one-subnet-per-LAN-segment limitation. (An IP LAN crossing, for instance, requires either broadcast-intensive bridging, which limits scalability, or routing, which can create an expensive performance bottleneck.)

APPN and HPR connection networks link computers on the same network without routing or bridging by matching names to network addresses at connection time. (For ATM switched virtual circuits, Q.2931 signaling data is used.) This means you don't have to configure everything to which you might ever connect in a global network.

No holds barred

HPR also offers an advantage over older protocols such as High-Level Data Link Control and TCP when it comes to flow control and error recovery. To gain full use of ATM speeds, the flow control and error recovery protocols must be decoupled, as HPR does with adaptive rate-based (ARB) congestion control and selective retransmission. Older protocols have just one mechanism to handle the two functions.

HPR also reflects subnet congestion notifications — backward and forward explicit congestion notification bits for frame relay and explicit forward congestion notification for ATM — in its header so ARB can relieve congestion at intermediate links.

In addition, Rapid Transport Protocol (RTP), HPR's streaming end-to-end delivery mechanism, is optimized for fast, quality links.

Although physical errors seldom occur on ATM , congested UBR connections may drop cells.

Unlike the older protocols that repeat everything after a lost frame, RTP selectively retransmits only missing data.

Good, better, best

The AIW considered these factors when it chose native HPR over ATM and rejected the alternatives — native ATM interfaces for subarea SNA or pre-HPR APPN.

Subarea SNA over LANE is good. APPN over LANE is better. Native HPR access is best. Only HPR with ARB takes full advantage of ATM speeds.

HPR, already available from IBM, will be universal in SNA products. As an ATM interface, it obsoletes windowing protocols. And it is more scalable than LANE.

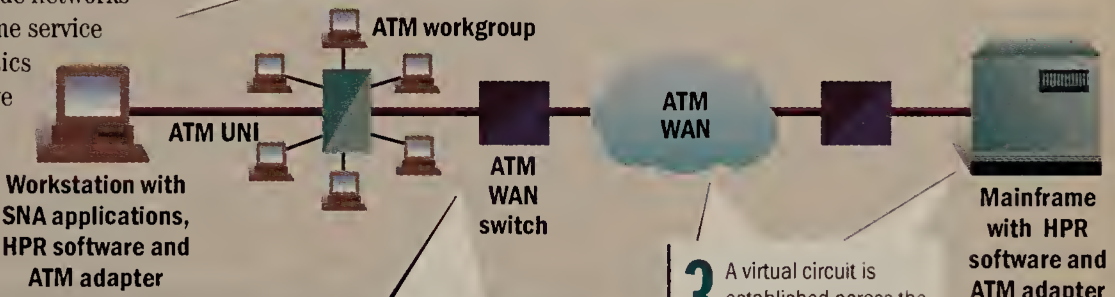
When you're ready for ATM and full QoS exploitation, HPR native access provides the answer.

Peters chairs the AIW's HPR Special Interest Group and Brotman is AIW chair. They can be reached at maria_peters@vnet.ibm.com and brotman@vnet.ibm.com.

HOW IT WORKS

HPR access to ATM

High Performance Routing software lets SNA application data seamlessly access and be carried across Asynchronous Transfer Mode networks with the same service characteristics it would have on native links.


ATM workgroup
ATM UNI
Workstation with SNA applications, HPR software and ATM adapter
ATM WAN switch
ATM WAN
Mainframe with HPR software and ATM adapter

1 After receiving class-of-service requirements and the recipient's NETID.LUNAME from the SNA application, the HPR software looks up the destination's ATM address and calculates the best route.

2 The ATM adapter passes the ATM Q.2931 signaling data – the destination ATM address, the quality-of-service parameters and the bandwidth requirement – to the switch across the User-to-Network Interface (UNI).

3 A virtual circuit is established across the ATM network and the SNA application data is directly switched to its destination.

Network World Fusion

Find out more about the AIW and its plans for HPR and other SNA-related standards on Network World Fusion (http://nwfusion.com). Select NetRef, Technology Resources then Mainframe Communications.

EDITORIAL INSIGHTS

'Free trade of ideas'

In trying to reform our telecom laws, Congress is raising hackles with its attempts to control indecency on the Internet.

Ironically, the indecency language in the reform bill being hashed out today wouldn't cover some of the most obscene material on the 'Net — material that's easily available to your kids. I'm talking about Web sites set up by various hate groups — white supremacists and other racists, Holocaust revisionists, et al — using the Internet as a powerful tool for spreading their so-called political opinions.

We've hailed the Internet as the next revolution in communications. But, like print, video, radio and every other medium, it has a dark side. The Web is as hateful, useful, powerful, vicious and beneficial as the people who manipulate it.

But whether you're talking about hate or sexually oriented material, censorship isn't the answer. No law can diminish the appeal of poisoned ideas to a certain minority, and it isn't realistic to think any government can keep anyone off the 'Net for long. Censorship adds a certain allure to any idea — no matter how warped — and history has shown that government control of communications has dire consequences.

"The ultimate good is better reached by free trade in ideas — the best test of truth is the power of thought to get itself accepted in the competition of the market," Oliver Wendell Holmes Jr. wrote.

Well, the Internet is the ultimate market, and some of the ideas for sale stink. But that doesn't mean we are powerless against those who spread hate. By publishing their messages on the Web, these groups expose their members to the public and their ideas to the cold light of scrutiny. Because the Web works both ways, they open their thoughts to criticism and dissection.

You can also apply the power of the purse to discourage your Internet service provider from hosting hate groups. Force your provider to have a conscience and express your concern — perhaps in concert with others — about incendiary messages. If things don't change, switch to another provider. Teach your kids what's good and bad on the Internet and alert other people to dangerous sites.

That kind of personal activism will always be more powerful than censorship.

John Gallant, editor in chief jgallant@world.std.com

Teletoons

By Phil Frank and Joe Troise
guru@well.com

Well... everybody was complaining about my pager going off in restaurants ... so I upgraded.
Phil Frank

THE BLUE VIEW

IBM must bridge SNMP and NetView/390 to claim lead in enterprise management

Anura Guruge

Times are definitely a-changin' when it comes to net management in IBM-centric enterprises.

For one thing, a recent survey of 474 worldwide IBM mainframe sites conducted by IBM-watcher Xephon PLC in Newbury, England, shows that Simple Network Management Protocol is now considered a more important network management scheme than NetView/390.

This is the first time users have unequivocally stated that SNMP is becoming a strategic management scheme for mainframe-centric environments and is likely to usurp NetView/390.

The results of this survey put into perspective two news items pertaining to IBM's network and systems management initiatives.

First, IBM recently claimed that porting its Unix-based NetView for AIX (aka NetView/6000) to run on top of Windows NT is a top-priority task for this year (*NW,* Oct. 30, page 1).

Given today's volatile networking market, porting an existing network management product from one platform to another is hardly what most of you would point out as one of IBM's pressing challenges.

The real requirement today is for technology to facilitate cooperative management using both SNMP and NetView/390.

Second, as a result of its highly contentious victory in the Enterprise Management Summit shoot-out (*NW,* Nov. 6, page 46), IBM is claiming SystemView is one of the best solutions for enterprise management — if not the best.

What is important here is that the product used for the shoot-out was also SNMP-based. After a cursory analysis, you might conclude that IBM is truly in sync with your views. Wrong!

SNMP-based management alone is not going to satisfy the stringent demands of enterprise management in mainframe-centric environments over the next five to six years. You sorely require a way to facilitate enterprise management using SNMP and NetView/390 in tandem.

Whereas there is no question that SNA-only networks will soon be history, SNA as an end-to-end application-to-PC protocol is going to be around for another 10 years, at least. This SNA traffic will flow across multiprotocol networks initially built around bridge/routers or frame relay access devices (FRAD) and will eventually migrate to ATM. You will manage the multiprotocol or ATM network using SNMP.

However, you will still have to manage the SNA traffic and the end devices using SNA — hence NetView/390. The reason is because most SNA devices cannot be managed using SNMP.

That means SNMP will be able to tell you the status of the connection up to the SNA device, but SNMP will not be able to tell you the status of the SNA device hanging off that connection. That information will still be visible only through NetView/390.

The real requirement today is for technology to facilitate cooperative management using both SNMP and NetView/390. On this front, IBM's SystemView offerings have not forged any new ground in quite a long time.

That brings into question IBM's current priorities when it comes to network management and its claim that it is a leading supplier of enterprise management solutions. Ironically, companies such as Cisco Systems, Inc., Cabletron Systems, Inc. and Sync Research, Inc. have been doing their best to provide compelling interworking solutions between NetView/390 and SNMP.

IBM's AIX SNA Manager/6000 permits a NetView for AIX operator to monitor and manage an SNA network via NetView/390. A NetView for AIX console can become a virtual console attached to NetView/390. Cisco and Cabletron have furthered this notion.

Using a mainframe application, you can now download ACF/VTAM and ACF/NCP definition files to an SNMP-based management system. The SNMP manager then extracts the exact SNA names used in these definitions and correlates them with SNA connections known to SNMP. Thus, when displaying a map of the multiprotocol network on the SNMP manager, both the SNA devices and SNA logical units are now identified by their SNA names.

While this does not provide actual management of the SNA devices or the logical units, it does serve a useful function: It allows an SNMP operator to immediately correlate network connection status of SNA entities.

Moreover, the SNMP operator can now identify and talk about these devices using their actual SNA names.

We also now have bridge/routers and FRADs with integrated NetView Service Points. Such service points enable NetView/390 operators to have direct visibility and control of devices that are typically managed by SNMP. IBM has yet to offer integrated NetView Service Points for any of its multiprotocol networking devices, such as the 2210 bridge/router or the 2220 ATM switches.

The bottom line is that SNMP management is the wave of the future. However, for the next five to six years, you will have to complement SNMP management with NetView/390. Thus, what requires the most attention from IBM is building solid bridges between these two disparate management schemes.

Today, IBM's competitors are taking the lead in this area. In the future, when IBM talks about its superiority in the field of enterprise management in mainframe-centric environments, it should also take into account the necessity for true cooperative management between SNMP and NetView/390.

Guruge is an independent consultant specializing in internetworking and IBM network architectures. He can be reached at (603) 878-1303 or at aguruge@mcimail.com.

THE INTERNET

Use gatekeepers to avoid Internet abuse

Jim Cavanagh

The real paradox of Internet access is that using global E-mail and perusing and downloading from many commercial, government and academic servers can improve productivity, while junk E-mail and electronic visits to digital singles bars during work hours can kill productivity.

Many companies have tried to address this issue by adopting a prudent use policy, which seems good in theory but fails miserably in practice because the policy is not strictly enforced.

A prudent use policy states that if it is not acceptable to physically leave the office during business hours for a trip to the wine store or to plan your family vacation, then it is not acceptable to do so electronically.

One problem with prudent use policies is that they don't always produce the expected results.

Take, for example, the help desk operator who received a call from the network security department. The keyword filtering software detected her passing lewd E-mail. But, as it turned out, the company had a valid customer in a town called Middlesex. The security software did not know the difference between good sex, bad sex and Middlesex.

Another problem is prudent use policies allow activity that is costly and nonproductive because Internet users must spend a certain amount of time surfing the 'Net to familiarize themselves with the locations of various servers and to learn how to best use them. If this familiarization time requires just one hour per employee per day, a company can multiply the total payroll amount of employees with Internet access by 1/8 and add the cost of providing that many hours of Internet access to determine the true negative financial impact.

Fortunately, there is a reasonable solution to this problem; unfortunately, it is not one that will be palatable to most citizens of the electronic frontier. It is to provide a secure mail forwarding gateway between the internal E-mail system and the Internet, and limit direct Internet access to a handful of designated Internet librarians, or gatekeepers.

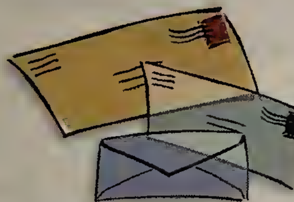
Gatekeepers could be entry-level employees who are at the lower end of the pay scale but have great Internet surfing skills. Their primary job responsibility would be to respond to search requests that employees send them on the internal E-mail system.

Essentially, they would perform reference librarian functions, with the Internet as their electronic library. They would forward the results of their research as attachments to the replies from the internal E-mail. It would even be possible for employees to make appointments with the gatekeepers to participate in searches if they anticipate that a search will involve a difficult or complicated treasure hunt.

The use of gatekeepers limits corporate exposure to Internet abuse while still allowing access to important information. The use of gatekeepers can be an important part of providing security from the Internet, as well, because the gatekeepers can scan all material for viruses before passing it along. These issues cannot be neglected, as companies are increasingly adding or expanding access to the Internet while demanding more productivity from each employee.

Will gatekeepers waste time downloading outrageous items, such as a screen saver showing first ladies' heads artfully grafted onto the bodies of farm animals? Probably. But at least there will be a controlled number of them doing so at reasonable hourly rates.

Cavanagh is an Atlanta-based consultant who focuses on frame relay, ATM, the Internet and other emerging technologies. He can be reached at (770) 984-5800.



IN-BOX

Lamentable service

I have to echo David Buerger's laments about ISDN service (Nov. 13, page 110). I recently called Bell Atlantic's business office and asked to talk to someone about ISDN rates. "ISDN? What's that? Do we have that?" was the response.

I eventually was told Basic Rate Interface service costs between $20 and $50 per month plus two cents per B channel. I then asked about the cost for Primary Rate Interface service. "Oh, I'm not trained in PRI," I was told. "You'll have to call someone else for that. I'll fax you the rate information we discussed with the phone number of the people you need to call for PRI."

The fax never came. However, I eventually got the PRI rate, which is about $900 per month plus five cents per B channel.

This is outrageous from both a business and financial perspective. One only has to use the PRI service for over 13 hours per month to make it cheaper to lease a full T-1 line.

At $900 per month, customers are already paying a usage premium for the higher bandwidth. Why, then, do PRI B channels cost 2 1/2 times what BRI B channels cost?

I've been unable to get anyone at Bell Atlantic to give me an answer. It seems no one there knows anything except how to pass the buck and gouge the customer.

Here's another rallying cry for local phone competition!

Brad Van Orden
Associate
Rapid Systems Solutions, Inc.
Columbia, Md.

Hidden motive

Regarding Daniel Briere and Christine Heckart's column "AT&T has a worthy defense on NNI" (Dec. 4, page 20):

While there may be some technical problems with the network management of Network-to-Network Interface (NNI), AT&T is using this excuse as a dubious disguise for a blatantly anticompetitive move.

The ability to build a usable enterprise network demands that we connect equipment and services from a wide variety of vendors. No vendor is big enough to provide all of the services needed — not even AT&T.

Ellis Hillinger
Network specialist
Simpson Timber Co.
Shelton, Wash.

The authors reply: AT&T is making a business decision based on three factors.

First, setting up NNIs that work is time-consuming and costly. In the U.S. market, less than 10% of customers really need to use both local and interexchange frame relay.

Is it a good business decision at this time for AT&T to focus on NNIs when there are other enhancements the carrier could develop that would benefit a greater percentage of customers?

Second, the RBOCs and interexchange carriers (IXC) are heading for serious competition, and the IXCs are concerned about the long-term strategic impact of being too closely entwined with the local exchange carriers.

Again, this is a very reasonable business concern and one that the carriers can't afford to take lightly.

Third, AT&T's network operates differently from the RBOCs' because of the closed-loop congestion management of the StrataCom, Inc. platform. Getting predictable end-to-end performance will be tricky.

AT&T is a business like any other. It should be given the same flexibility in making business decisions, and the market should be able to react to those decisions by either buying or not buying the carrier's services.

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DMSs getting mix-and-match wardrobe

By Linda Musthaler

This could be a watershed year in the document management system (DMS) market if vendors start delivering products that support an emerging interoperability standard.

And the odds for that happening appear good. Vendors are falling all over themselves to pledge support for the standard, which was drafted by the Document Management Alliance (DMA), a consortium of more than 80 firms. This standard eventually will make it possible for you to mix and match DMS components from disparate vendors and easily get them to work together.

But don't cancel the contract with your systems integrator just yet. The draft standard — a melding of the Novell, Inc.- and Xerox Corp.-backed Document Enabled Networking effort and the Shamrock Document Management Coalition's Enterprise Document Management specification — is only now making its final rounds through the industry.

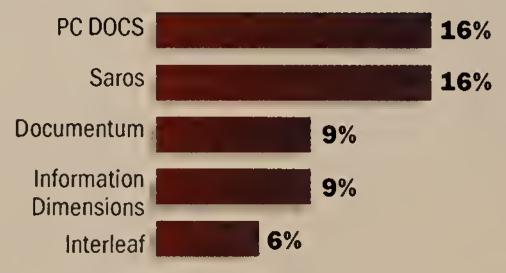
The standard has the potential to dramatically change the way you buy a DMS, which in its basic form, includes several components that electronically track stored documents. For example, a document creation or collection module enables users to write manuals with a word processor and drawing program that is integral to the DMS in order to collect such material from stand-alone document creation applications.

There also is a library management function that checks documents into a database and builds a searchable index of them, keeping track of various document versions and where each is stored.

Client applications enable end users to search the document index and retrieve only those documents that contain keywords or address specific subjects. Once retrieved, documents can be viewed, edited and distributed across the company using other components.

NO CLEAR LEADER

Many DMS vendors have significant installed bases, but none has more than a 20% market share based on revenue. Delphi Consulting Group of Boston says the top five are:



If you'd rather not wait the few years it will take to fully implement the standard, you can turn to a vendor that has integrated all the various components into a proprietary DMS.

Alternatively, you can buy core components such as document collection, library and indexing functionality from a DMS vendor. Then you could use a systems integrator or value-added reseller to hook those pieces into existing word processors, drawing programs and electronic mail.

This integration work can easily double or triple product acquisition costs, which can run upward of $50,000, depending on the number of seats you buy.

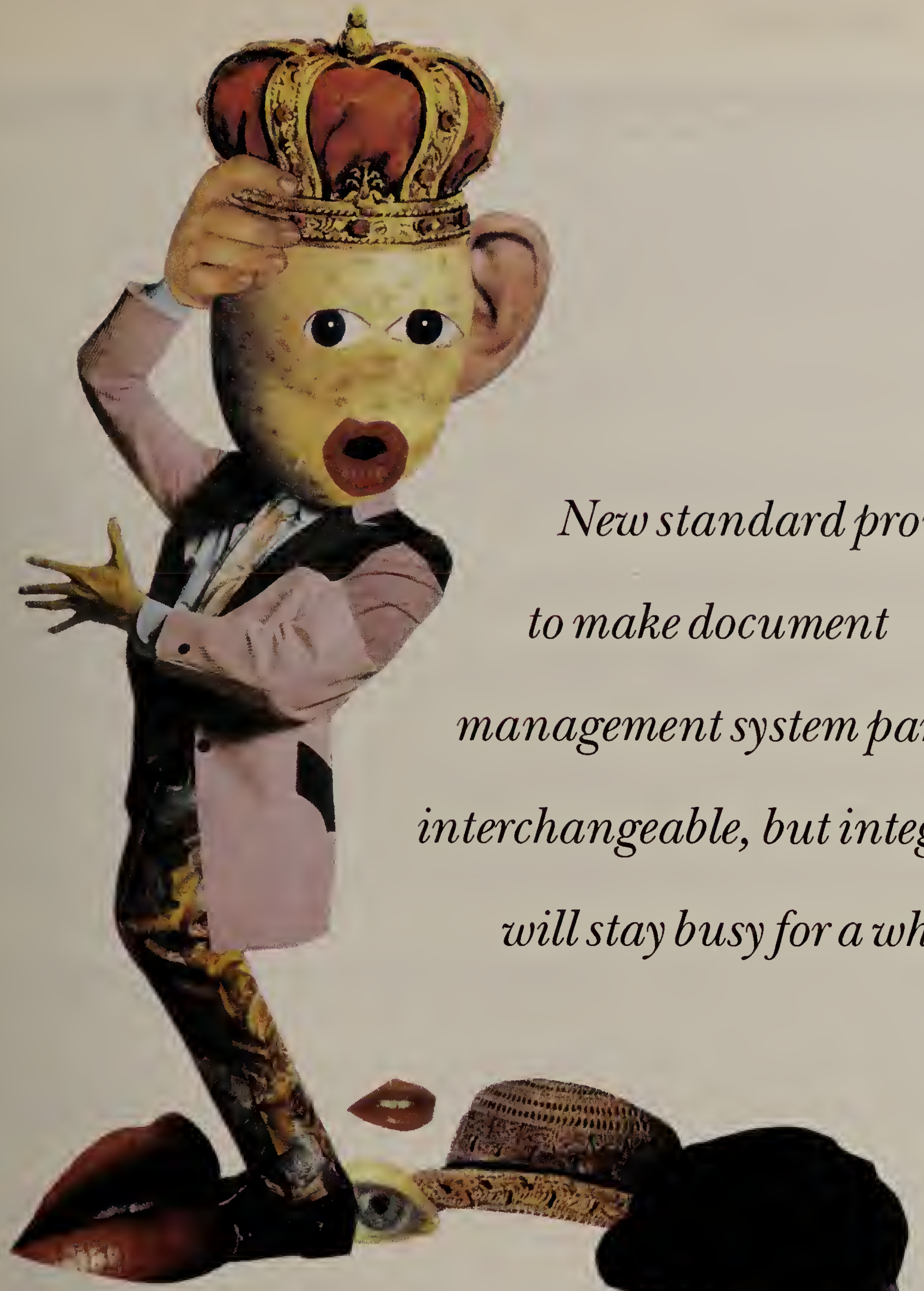
That is why you have to pay close attention to how the vendor has sculpted its DMS. And the clear trend is toward an architecture that favors open systems and client/server technologies.

Keep this trend in mind as you make your DMS selection, one that requires you to analyze how your business uses documents as well as the types and number of them you keep. That analysis should tell you which features and capabilities are most important to you.

Examining document creation or collection features can be a starting point. If the product can't handle the type of documents you create, it's useless. But there is good news here.

In recent years, the Open Document Management's API, called ODMA, has enabled document creation application vendors to link their products with a DMS, reducing custom integration requirements.

DMSs do their part in this mission of working with stand-alone document creation and other applications by supporting a variety of standard file formats. Most of the products in the Buyer's Guide chart on



New standard promises to make document management system parts interchangeable, but integrators will stay busy for a while.

page 40 manage ASCII, Document Content Architecture and Rich Format Text as well as proprietary word processing, spreadsheet and presentation graphic file formats. In addition, many DMS products support standard image, digitized audio and video file formats.

The DMS applications doing all this document and file management run on a network server or host. Unix used to be the most dominant operating system and is still quite prominent today. However, Microsoft Corp.'s Windows NT is quickly becoming a de facto standard, largely due to its openness and scalability.

Check out the librarian

An area that requires closer attention is the type of library management tools provided. These tools give you a way to control who can use which documents through check-in/check-out, usage tracking, version control and document retention features.

Library tools also ensure that only authorized users can get at the documents. Security is often provided at various levels, including by user or workgroup. Different versions of a document are also strictly monitored to make sure that a new version is not superseded by an older one.

If accountability is important to you, look for a library management system that keeps historical information on documents, such as who worked on them and when, how many versions exist and who created them. DOCS Open from PC DOCS, Inc. enables you to track 99 versions of a document and control whether or not previous versions can be edited.

Document retention and destruction information is also maintained by the library, including how long a document is kept and how it is disposed of. Proper disposal can be a bit of a problem, although it is important for sensitive documents. When you delete a document, you want to make sure that all versions of it are completely removed, as opposed to simply marking them inaccessible, which occurs with the DELETE command of most desktop operating systems.

A DMS will provide a storage component that typically enables you to keep full copies of documents wherever you want, whether that is on multiple servers, individual hard disks, or even in an off-line or near-line storage management system such as a tape drive or an optical storage jukebox.

Many DMS products support a hierarchical storage management system, which automatically migrates less frequently used documents onto cheaper off-line storage while keeping frequently accessed documents readily available on primary hard-disk storage.

Documents can even be stored on a nomadic user's laptop. As a general trend, more DMS products are addressing the needs of mobile and remote workers.

Saros Corp. has an interesting approach to remote user support. An option to its Saros Document Man-

Continued on page 40

Document mgmt. system helps Ford unit get WISE

It was 3 1/2 years ago when Geometric Results, Inc. (GRI), a Ford Motor Co. subsidiary, got WISE — the Worldwide Integrated Standards for Engineering, that is. WISE is part of the Ford 2000 program, an effort to have commonality in Ford's product line around the world.

Under WISE, thousands of engineers worldwide will design automobiles to the same standards. Herein was the challenge: to find an electronic document management system (DMS) to handle reams of design and engineering information.

Ford conducted several benchmark studies of DMSs, including internal as well as external DMS users, says John Gusman, project manager in the electronic document management group at GRI. The company wanted one DMS that could do it all — authoring, publishing, document management, distribution and control.

"At the time, Interleaf [Inc.] offered the only product that met all our needs," Gusman says.

GRI set out to put all of Ford's core engineering documents on-line. More than 5,000 Ford engineers worldwide now have access to the same documents.

Gusman says they have reduced document search time from the 10 to 20 hours it took in the manual process to under an hour using Interleaf's Intellecte/Access.

"The engineers know they are looking at the latest update of a document when they view it on-line," Gusman says. "We've eliminated data integrity problems that were inherent in the manual document process."

And there's more, Gusman says. "Best of all, every document is tightly integrated. When one document refers to another, the user can easily bring up the referenced document."

For example, when a worldwide design requirements document refers to engineering testing procedures in another document, the engineer can go straight to the related data.

"There's no doubt we've seen a payback from implementing this system," Gusman says.

Aside from Interleaf's integrated product offering, GRI was attracted to Interleaf's short implementation plan. "We like to deliver a working system in 90 days or less," he says. "Interleaf enabled us to do that through their bundled consulting program."

At Ford, they say, "Quality is job one." The company's WISE program and the DMS are enabling Ford to meet that goal.

By Linda Musthaler

Document management systems

Company	Product	Type	Host operating system	Network environment						Client operating system				Database engine	Industry standard				File management					Pricing
				LAN Manager	LAN Server	NetWare version	TCP/IP	VINES	Windows NT Server	Macintosh	OS/2	Unix	Windows version		DMA (1)	ODMA	OLE 2.0	SGML	Automatic archiving	Automatic deletion	HSM system integration	Schedules processes	Version control	C = Per client S = Per server U = Per user/No. of users
Access Corp. (513) 786-8350	Cimage Document Manager	Enterprise, workgroup	Unix	✓	✓	3.X, 4.X	✓	✓		✓		✓	3.X, 95	Third party	✓	✓	✓				✓	✓	✓	C = $644-$6,090 U = $17,995/1-5
askSam Systems (800) 800-1997	askSam 3.0 Professional	Workgroup	OS/2; Windows 3.1, 95	✓		3.X, 4.X		✓	✓		✓		3.X, NT, 95	Proprietary					✓	✓				U = $395-$25,280/1-100
Compulink Management Center, Inc. (310) 212-5465	LaserFiche NLM 3.0	Workgroup	NLM			3.X, 4.X							3.X	Proprietary, third party	✓				✓		✓			U = $7,995-$11,995/ 5-10 concurrent
Documentum, Inc. (510) 463-6800	**Enterprise Document Management System**	**Enterprise**	**Unix, Windows NT**				✓		✓	✓		✓	**3.X, NT, 95**	**Third party**	✓		✓	✓	✓	✓	✓	✓	✓	**U = $500-$1,500/1**
Information Dimensions, Inc. (614) 761-8083	Basis	Enterprise	MVS, Unix, VMS				✓			✓		✓	3.X	Proprietary	✓			✓	✓	✓		✓	✓	C = $200 S = $20,000
Interleaf, Inc. (800) 955-5323	**Intellecte/Access**	**Enterprise**	**Unix**	✓	✓	**3.X, 4.X**	✓	✓		✓		✓	**3.X, NT**	**Third party**	✓	✓	✓	✓	✓	✓	✓	✓	✓	**C = $695-$895**
Keyfile Corp. (603) 883-3800, Ext. 343	Keyfile	Workgroup	OS/2, Unix, Windows NT	✓	✓	3.X	✓						3.X, NT, 95	Proprietary (2)					✓	✓	✓	✓	✓	C = $795 S = $7,995
LaserData, Inc. (800) 527-9773	DocuData	Enterprise	NLM, Windows NT			3.X, 4.X			✓				3.X	Third party							✓			C = $495 S = $7,455 (3) U = $600-$1,250/1-400
Lotus Development Corp. (800) 346-1305	Lotus Notes 4.0	Enterprise, workgroup	NLM, OS/2, Unix, Windows NT	✓	✓	3.X, 4.X	✓		✓	✓	✓	✓		Proprietary			✓		✓	✓	✓	✓	✓	C = $55-$275 (4) S = $495-$2,295 (4)
NovaSoft Systems, Inc. (617) 221-0300	NovaManage	Enterprise	OS/2, Unix, VMS, Windows NT			4.X	✓		✓	✓		✓	3.X, NT, 95	Third party	✓							✓	✓	U = $1,000/1
Novell, Inc. (800) 861-2507	SoftSolutions 4.1	Enterprise	DOS, NLM	✓	✓	3.X, 4.X		✓					3.X	Proprietary	✓	✓	✓		✓	✓	✓	✓	✓	S = $495 U = $295/1
OPN Systems, Inc. (800) 676-1177	OPN Enterprise	Enterprise	Unix				✓					✓	3.X, NT, 95	Third party					✓	✓		✓	✓	C = $85 U = $3,195-$36,495/8-128
PC DOCS, Inc. (617) 273-3800	DOCS Open	Enterprise	Macintosh, MVS, NLM, OS/2, Unix, VM, VMS, Windows NT	✓	✓	3.X, 4.X	✓	✓	✓	✓	✓		3.X, NT, 95	Third party	✓	✓	✓		✓	✓	✓	✓	✓	C = $349-$449 S = $795-$1,495
Salix Systems (800) 725-4948	DocStor 2.2	Enterprise	Unix				✓					✓	3.X	Proprietary					✓	✓			✓	C = $1,000 S = $5,000 U = $4,750/5
Saros Corp. (800) 827-2767	**Saros Document Manager**	**Enterprise**	**NLM, OS/2, Unix, Windows NT**	✓	✓	**3.X, 4.X**	✓	✓	✓	✓	✓	✓	**3.X, NT, 95**	**Third party**	✓	✓	✓	✓	✓	✓	✓	✓	✓	**C = $495**
ViewStar Corp. (800) 353-3517	ViewStar	Enterprise	Unix; Windows 3.1, 95			4.X		✓	✓				3.X, NT, 95	Third party	✓	✓	✓		✓	✓	✓	✓	✓	C = $1,200 S = $5,000-$20,000 U = $15,000/10
Westbrook Technologies, Inc. (800) 949-3453	File Magic Plus 4 Series	Enterprise	(5)	✓		3.X, 4.X		✓	✓				3.X, NT, 95	Proprietary	✓				✓		✓	✓		U = $2,000-$10,000/1-10
XSoft/Xerox Corp. (800) 428-2995	Visual Recall 2.0	Enterprise	NLM, Windows 3.1			3.X, 4.X							3.X	Third party	✓	✓							✓	C = $395 S = $695
Xyvision, Inc. (617) 245-4100	Parlance Document Manager	Workgroup	Unix				✓					✓	3.X, 95	Third party				✓	✓			✓	✓	C = $2,450 (6) S = $30,000 U = $63,000/8 (6)

Product names highlighted in color were selected for the Short List.

Chart compiled by Kathy Scott

Footnotes:

(1) Vendors plan to support interoperability specification of the DEN/Shamrock Convergence.

(2) Accessible by SQL/ODBC applications and databases.

(3) For 5-user server.

(4) Estimated retail pricing for volume purchases.

(5) NOS-independent.

(6) Floating license includes embedded run-time licenses.

DEN = Document Enabled Networking

DMA = Document Management Alliance

HSM = Hierarchical Storage Management

NLM = NetWare Loadable Module

ODMA = Open Document Management API

SGML = Standard Generalized Markup Language

Continued from page 39

ager lets roving workers replicate documents to their laptops. While off-line, the user checks the document out of a laptop library, makes changes and checks the document back in.

When a document is checked out of the laptop library, the user is warned that he is disconnected from the net where the DMS runs and may have to save the document as a new one when reconnecting to the net.

Once the user reconnects, the DMS checks to see if anyone else checked out the document and made changes. If so, the document taken from the laptop library must be checked into the DMS as a new document or a secondary version of an existing one. If no changes were made, the document can be saved from the laptop library into the DMS as the latest version of an existing document.

Index pointers

The DMS relies on an index to perform much of its magic.

The index is essentially a database that maintains pointers to where documents are stored and is commonly built on top of a standard SQL-based database management system.

Some DMSs come with a proprietary DBMS or dictate which third-party DBMS you must use. For example, Novell's SoftSolutions 4.1 uses a proprietary database. Products that work with third-party DBMSs commonly support products from Btrieve Technologies, Inc., Microsoft, Oracle Corp. and Sybase, Inc.

Once a document is stored in the DMS, information about it is automatically stored in the index database. End users can search the index database instead of the documents to locate the files that meet specific search criteria. How a DMS employs indexes affects the speed and quality of searches.

The ways in which products index and retrieve vary widely. Vendors such as Verity, Inc. and Fulrum Technologies, Inc. license their search and retrieval technology to DMS vendors. But a handful of vendors, such as the XSoft division of Xerox, have developed their own search and retrieval technology.

One of the most common forms of indexing is full-text, which lists all the significant words in every managed document. With a full-text index, words are coupled with pointers that reference all the documents in which they appear. When an end user queries a full-text index file, the pointer information informs the DMS about which documents to retrieve in order to complete the search.

Other indexes store only user-defined keywords or file attributes, such as the file creation date or author, or a project code, customer name or account number. Some DMS products also create relationships among certain words in the index file. For instance, users can create a search term called "travel" and stipulate that any document with the words "airplane," "hotel" or "rental car" will be a match.

The search engine in XSoft's Visual Recall 2.0 supports word derivations. For instance, when searching for documents that contain the word "hunt," the index also will turn up those with "hunter," "hunting" and "hunted."

Upon search completion, users receive a listing of all the documents that match the criteria. While a number of products give a thumbnail view of the documents, XSoft's Visual Recall has a unique three-dimensional graphical display that can point out trends or relationships between documents based on their attributes.

Access Corp.'s Cimage Document Manager supports a unique graphical hypertext link to other related documents. For instance, someone viewing a processing plant drawing can click on a specific part, say a smokestack, to automatically get any documents that are relevant to that structure.

Workflow and other key items

When all the core functional pieces are in place, your focus should shift to how well a DMS can route documents around the enterprise in some predefined fashion. After all, routing, distribution and workflow features will truly eliminate paper.

Most DMSs provide APIs for simple integration with existing E-mail systems, particularly those that support the Vendor

Independent Messaging (VIM) or Messaging Application Programming Interface standards.

Unless you are well versed in Visual Basic or C++, however, be prepared to spend a lot of integration dollars on this effort.

Some DMS products, including ViewStar Corp.'s ViewStar and OPN Systems, Inc.'s OPN Enterprise, have strong workflow capabilities that take document routing to a higher level. The type of workflow these products support makes it possible to route a document through the organization according to a prescribed path, and have audit trails and electronic signatures to verify that action was taken by each person receiving the document.

Document assembly is another important feature to examine, one that permits the DMS to pull together compound documents comprising individual objects. This object orientation enables such objects as diagrams or graphics to be stored once but used in many documents.

Products such as Documentum, Inc.'s Enterprise Document Management System use object technology to support document-level transactions, with complete rollback and commit features similar to those found in a relational DBMS.

For example, an engineer needing to update four separate drawings only has to initiate one update transaction. If the update for any of the four drawings fails, then all four drawings roll back to the previous version, preventing one from being out of sync with the others.

Most other DMSs support document assembly through Microsoft's OLE or plan to support Component Integration Labs' OpenDoc standard when it becomes available.

On another front, most DMSs provide a viewing component for users who want to look at but not edit documents. The more popular viewers are Adobe Systems, Inc.'s Acrobat and Novell's Envoy, which enable users to view a document's original structure and format, even if their workstation does not have the document's originating application or the appropriate fonts.

Year of the DMS?

With all that's happening on the standards front, 1996 should be an exciting year in the document management industry.

As you shop around, define your requirements carefully and look for a product that best meets your business process needs.

Also, do a reality check on your budget for the project. If you don't have the funds to do some hefty integration work or pay a systems integrator, your product choices may be limited or you might be forced to wait until the DMA specification is widely implemented.

Tread carefully through the process because, given the flood of information that is coming at workers from all sources — E-mail, fax, the Internet or paper — a DMS may be the most strategic purchase you make this year.

Musthaler is vice president of research at Currid & Co., an information technology consulting firm based in Houston. She will lead a document management seminar at Digital Consulting, Inc.'s Software and Client/Server World conference in Toronto from April 10-12. Musthaler can be reached via the Internet at linda@ngwgate.mhs.compuserve.com or by phone at (713) 789-5995.

NetworkWorld Fusion

There is more information about the document management products listed in the Buyer's Guide chart on page 40 on Network World Fusion. From the main menu, select NetRef then Buyer's Guide.

You'll also find a link to the Document Management Alliance's recently published interoperability specification and others to pages with information about upcoming conferences and a market study.

Reader views on document management systems

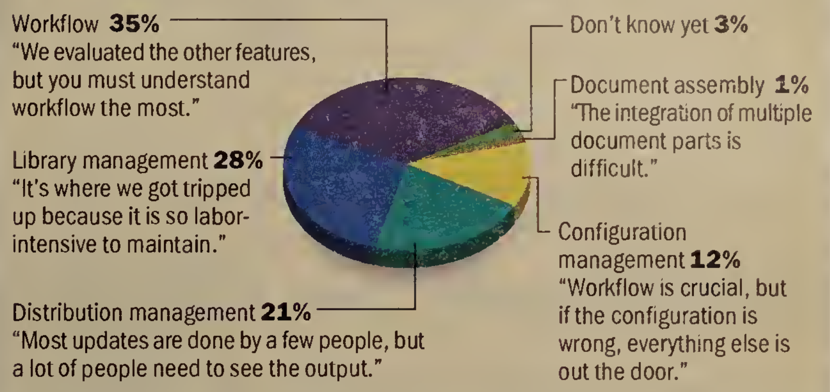
Based on 100 interviews.

Features requiring the most comparison among products

(Lower score means more comparison is needed. Lowest score is 1. Highest score is 5.)

Ease of use and administration	**2.29**
Cost per user	**2.36**
Support for heterogeneous platforms	**2.63**
Technical support/training	**2.74**
Support for compound document management specifications	**2.81**
Clients supported	**3.28**

Feature requiring closest examination and why



Focus Data, an independent market research firm in Framingham, Mass., conducted this survey. Focus Data specializes in gathering primary data from end-user organizations regarding their enterprise network environment and needs. For more information about Focus Data services, send E-mail via the Internet to mdabbon@focusdata.ultranet.com or call Mona Dabbon at (508) 626-2556.

NetworkWorld
Short LIST

Document mgmt. systems

The Short List highlights products Network World *recommends you examine closely when evaluating document management systems. Products making this Short List provide excellent text management facilities, document library functions, version control, full-text search and retrieval features, document routing and distribution, and compound document assembly. These products can meet the needs of users with multivendor enterprise networks. Your needs may differ.*

Interleaf, Inc.'s tightly integrated **Intellecte/Access** suite of applications offers automation functions for supporting business-critical processes that rely on documents. The suite's Relational Document Manager module is the engine that tracks and manages text, graphics and other document components as separate objects. Another module, the WorldView system, enables users to access, navigate through and print documents. The suite also includes Liaison, an open API and framework for integrated document management, and Production Manager for automating processes. An optional component, Interleaf 6, can be used for authoring and publishing sophisticated documents. Moreover, Interleaf is helping to forge industry standards. One Interleaf representative chairs the Document Management Alliance's technical committee, while another is president of the Standardized General Markup Language Open group.

Documentum, Inc.'s Enterprise Document Management System (EDMS) provides a foundation for capturing business rules and automating key business practices and policies. The product's unique Docbase capability combines document, object, workflow and relational database technologies. Docbase captures, stores, indexes and manages the attributes, relationships, content and operations of documents, as well as the objects associated with a document, such as workflows, annotations and business rules. EDMS also manages document components as objects.

Saros Corp.'s Saros Document Manager, which operates on the SarosMezzanine platform, offers a lot of flexibility, running in a wide variety of network environments and supporting a range of server and client operating systems. Saros' focus has been on creating a high-performance and scalable library engine, layering an easy-to-use client interface on top of it. Of its many features, Saros Document Manager offers good document-level security and support for remote users.

Guide to getting a good viewer

Your boss wants to see that important proposal you've been working on all week. So you send it electronically without worrying if your boss has the right application software or the correct fonts to view it.

That's because you've used a portable document utility that converts your work from any application into a common formatted file that anyone with the right viewer software can read.

The document viewers are becoming an important part of any document management system (DMS), with many vendors bundling at least one viewer with their products.

There are many document viewers on the market, although Adobe Systems, Inc.'s Acrobat seems to be grabbing the lion's share of the press and client disk space. Other popular portable document products include Common Ground from Common Ground Software; Envoy from Novell, Inc.; WorldView from Interleaf, Inc.; Dyntext from Electronic Book Technology; and Outside-In from Software Compatibility Corp.

The big benefit of viewers is that they save you the expense of purchasing all possible authoring applications. For instance, a viewer enables you to see a document created in WordPerfect — with virtually all the document's formatting preserved — without loading WordPerfect itself.

Of course, no viewer can provide a 100% perfect translation of a document. The original authoring tool will always provide the best representation of the document. However, most viewers are good enough.

As you select a viewer, make sure it runs on the various clients you have, everything from Windows, Macintosh, Unix, OS/2 and even character-based workstations.

Yes, some viewer vendors provide a character translation of a document.

For instance, FTPKeyview is the viewer bundled with OPN Systems, Inc.'s OPN Enterprise.

It can translate graphical documents into a character display for those users who have a character-based terminal.

Licensing can be another important consideration. If a viewer is bundled with a DMS, the license often allows you to install the viewer only on workstations where the DMS client is installed. You may actually need a viewer on workstations that don't license the DMS client, so check the fine print of your purchase agreement before you start indiscriminately installing the viewer.

By Linda Musthaler

VIEW THE VIEWER REVIEW

Adobe's Acrobat, Common Ground's Common Ground and Novell's Envoy are the focus of a product review on page 42.

Pick a platform for

These three electronic document publishing applications make it easy to share diverse formats across an enterprise.

By John Ketchersid

Electronic publishing means never having to say you're incompatible. Today, document publishing programs allow users to create portable documents that can be read by a viewer application, regardless of whether the viewer is running the original application, or even on the original platform. This kind of technology is becoming more popular with the advent of file distribution across the enterprise and the Internet.

The top competitors in this field are Acrobat from Adobe Systems, Inc., Common Ground from Common Ground Software, Inc. (formerly No Hands Software, Inc.) and Envoy from Novell, Inc. We found Acrobat to be the most stable and to have the best image quality of the three, but it's by far the most expensive. Acrobat gets the thumbs-up for best PostScript conversion. Its font recognition and substitution was likewise tops in our test. Ditto for Acrobat's support of objects, such as sound files, graphics and hypertext links. Adobe's handling of these types of objects was exemplary.

Common Ground's graphics conversion gave us the truest high-color graphics and provided a speedy viewer. But it stumbled upon unexpected fonts during our batch conversion of PostScript files.

Envoy created the smallest files in the shortest amount of time. However, it had the least acceptable graphics rendition when compared to the original, and it lacked the option for batch processing of PostScript files.

In general, each of these products publishes documents in two ways. You can convert batches of PostScript documents (except in Envoy, which lacks this facility), or you can print to a publishing format directly from any application by using special printer drivers provided by the publishing software vendors.

On the receiving end, all three vendors distribute viewer applications at no charge via the Internet. All applications may be integrated with Web browsers to allow direct viewing of files from within the browser.

Publishing a document in any of the three products is simple. As an example, from a system running Windows for Workgroups 3.11, we created a five-slide presentation using Software Publishing Corp.'s Harvard Graphics for Windows, then printed the presentation to a PostScript file. We then moved the PostScript file to the input directory on the server to await conversion. Acrobat's Distiller and Common Ground had been configured to watch this directory for incoming files, create a new file in the vendor's file format and place it in an output directory.

This method is a good alternative for situations where there are a large number of PostScript documents that must be converted. However, when PostScript documents are converted to the publishing file format, the resulting file is not always a true representation of the original, especially for documents that incorporate custom fonts or fonts that have been modified through scaling or nonproportional size adjustment.

Another option, and one that provides more consistent results, is to use a printer driver bundled with each application to generate a file in that vendor's portable file format. The downside of this setup is the need to install the printer driver on each system from which you intend to publish documents. When creating files via the printer driver, all of the products created were reasonably accurate representations of our documents.

In an effort to test the autoconversion processing facilities of both Acrobat's Distiller and Common Ground, we copied three PostScript files of *Network World* pages to the input directories for each of the applications. Acrobat's Distiller application did the best job of converting PostScript documents that had a large number of fonts. This high-quality font recognition is due in part to the inclusion of Adobe Type Manager. Acrobat was able to convert the majority of documents without serious errors. The only real difficulty was in processing documents that incorporated custom fonts or fonts that had been resized in a nonproportional fashion. In those cases, the font substitution usually caused the text to span beyond the borders of the frame.

Acrobat's performance was enhanced when using a different PostScript file setup. When printed as a tab-size page, the output file was unwieldy and would have taken hours to convert. When the same document was printed at a smaller page size, the 1.4M-byte PostScript file was converted by Distiller in 94 seconds.

Common Ground's AutoMaker was not able to complete the autoconversion process at all. When it encountered a font that it was not familiar with, it simply made a log entry and placed a copy of the file in a failed subdirectory. After the conversion process, any of the PostScript documents in this reject directory can be converted manually by opening them in another application and using the printer driver file-creation facility. Common Ground says that an upgrade to the software and a small amount of fidgeting around with the font substitution table will fix this problem.

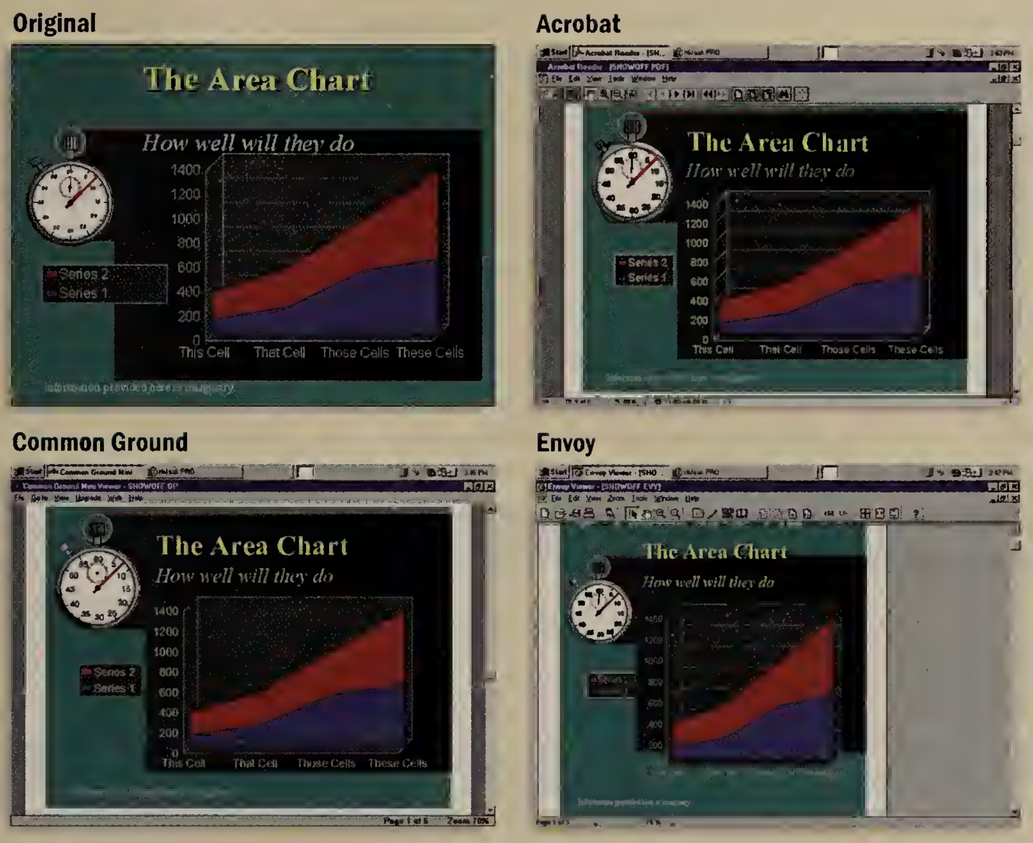
Envoy does not support the automatic

NetResults

Product	Acrobat 2.1	Common Ground 2.0	Envoy 1.0a
Vendor	Adobe Systems, Inc. (800) 272-3623, (415) 961-4400	Common Ground Software, Inc. (800) 598-3821, (415) 802-5800	Novell, Inc. (800) 451-5151, (801) 226-6800
Price	Acrobat Exchange: $195 for Windows or Macintosh, $295 for Unix Acrobat Pro (includes Acrobat Distiller): $595 for Windows or Macintosh, $1,895 for Unix Acrobat for Workgroups: $1,595 for Windows or Macintosh, $3,295 for Unix Adobe Acrobat for Windows: $195	$189 per user for Windows or Macintosh $2,500 for Auto Maker for Windows $299 for Personal Auto Maker	Envoy Publisher and Envoy Runtime: $189 for Windows or Macintosh
Pros	Best PostScript conversion	Best high-color compression	Fastest conversion Integrates with other Novell products
Cons	None significant	Conversion terminates when problem is encountered	No automatic PostScript conversion

publishing papers

COMPARING THE CONVERSION



Original

Acrobat

Common Ground

Envoy

Even on a simple graphic, differences from the original image are readily apparent. Full-size JPEG versions of these images and of a 3-D graphic image are also available for download on Network World Fusion.

conversion of PostScript documents. If you do have a large number of PostScript documents and you want to use Envoy, you must open each PostScript document and print it using the file-creation printer driver. This makes Envoy a poor choice for batch conversion of PostScript files.

On electronic paper

Adobe calls its Acrobat-formatted documents portable document files (PDF). Version 2.0 provides for creation of hypertext links to external PDF files and to other applications. There are three flavors of Acrobat. The standard version allows you to create PDF files, which are viewable using the Acrobat 2.0 Reader. Adobe's Acrobat Professional version includes Adobe Distiller, which empowers the user to convert PostScript-formatted documents to PDF format by simply copying the files that are to be converted into a defined directory.

This is by no means a small point of consideration, especially in cases where large numbers of PostScript documents need to be converted. The third version, Acrobat for Workgroups, includes a 10-user license for the Acrobat publisher and a single license for both Distiller and another utility called Catalog, which is a text-based search facility and cataloging system. Catalog allows you to build indexes and tables of contents, which make locating documents a more pleasant experience. Adobe also bundles Adobe Type Manager with all versions of Acrobat.

Common Ground and its Digital Paper format may be more suitable for smaller office and publishing work, mostly due to low $189 price tag. That's if you can put up with its font recognition problems. When Common Ground's PostScript font conversion engine runs into a font that is not installed on the system, it stops the conversion process for the whole document. The work-around requires that you install all the fonts used by the people creating the documents on your network onto the conversion server. However, the print driver publishing method holds its own against the competition; in fact, the conversion of high-color graphics within a document is the truest of the three.

Common Ground embeds a viewer in every output document, similar to what Sun Microsystems, Inc.'s Java will do with Internet documents. With this approach, you need only click on a document and the embedded viewer allows the user to view it. The advantage of this approach is that you don't have to install a viewer application on everybody's desktop. A disadvantage is that documents take longer to download across a network because they contain not only the document, but also the information required to view it.

Novell's Envoy is also very good with graphics, particularly in the area of compression. It produces the smallest files of the three products. The compression operations supported by Envoy are offset, however, when distributing documents in run-time format, due to the large size of the Envoy Viewer.

Envoy is a component of Novell's PerfectOffice suite and takes advantage of Novell's GroupWise by allowing you to submit documents to groups of users with a receipt option, which notifies the publisher when a document is viewed. Like Common Ground, Envoy can attach a copy of its viewer to published documents, creating a run-time version of the document. Although Envoy does not support direct conversion from PostScript format to Envoy format, it offers a nice set of publishing options, a solid search facility and a robust document management system.

Choosing a standard platform

For most applications, we'd recommend Adobe Acrobat. It produced excellent image quality with good performance and handled batch conversion of multiple documents with aplomb.

If your intent is to distribute information to facilities or personnel that do not have direct access to the Internet or your LAN, then Common Ground and Envoy merit a look. Both support run-time file creation, thereby avoiding the need for installation of a viewer on the system used for viewing. Common Ground has the smaller of the two viewers and sports the best high-color graphics compression.

If the information is to be published to only a select group of people and your organization already uses PerfectOffice, then Envoy is a logical choice for its designated routing support.

Shortly before press time, Common Ground announced it was being acquired by Hummingbird Communications, Ltd., a Toronto-based vendor of X Window and connectivity software. Common Ground will be integrated with Hummingbird's Columbus suite of Internet applications.

Log on to Network World Fusion for a discussion of electronic publishing options, plus a chance to download each product's viewer. From the main menu, select NetRef, then Buyer's Guides and Reviews.

NetworkWorld Fusion

HOW WE DID IT

We installed each publisher application on a 90-MHz Pentium server running Windows NT Server 3.5 and equipped with a Standard Microsystems Corp. PCI-bus Ethernet card, 32M bytes of RAM and 4.1G bytes of disk storage.

We installed viewer applications on clients running Windows for Workgroups 3.11 and Macintosh System 7.01.

We created five pages comprising both text and graphics in Harvard Graphics. We printed the files to an output directory in PostScript format. We then converted them to a published format using each product's batch conversion utility. We also used each product's bundled printer driver to print files directly into published format. We noted conversion times and checked output file sizes to see how well each product's compression worked.

We viewed each document on both Windows and Macintosh clients, and compared them with the originals to see how similar they were.

The alliance is a cooperative of users, consultants, educators and integrators that applies its technical and business skills to analyze and compare strategic network products. A list of alliance partners can be found on page 37.

NetworkWorld TEST ALLIANCE

Ketchersid is president of Latsu, Inc., a hard-media magnetic storage system research and development firm in Atlanta and vice president at ElectricPages, an Internet and Web presence provider in Bel Air, Md. He can be reached at hardware@electricpages.com.

Management Strategies

Covering: Career Insights and Innovations in Managing Staff, Budgets and Technology

Briefs

Fore Systems, Inc. *has named* **Automation Research Systems, Ltd. (ARS)** *of Alexandria, Va., as its first* **Certified Training Partner (CTP).**

As a CTP, ARS will conduct a series of seminars and classes concerning the use of Fore's products. ARS will also run classes relating to Asynchronous Transfer Mode technology and will use the same curriculum and equipment that Fore uses to conduct similar seminars and classes in its Pittsburgh training center.

ARS is currently enrolling students for its ATM Theory and Operation class, as well as for a class that provides instructions on the use of Fore's ForeView Network Management system.

ARS: (703) 824-6400.

A **salary survey** *published by* **Positive Support Review, Inc. (PSR)** *of Santa Monica, Calif., found that chief information officers in companies with revenue of more than $500 million are pulling down an average salary of $201,000.*

Their peers in smaller companies make an average of $141,0000.

The survey is based on interviews with more than 100 organizations in 73 major cities.

An electronic version of the survey results is available for $99, while a 100-page printed copy costs $395.

PSR: (301) 453-6100.

The **National Automated Clearing House Association (NACHA)** *has awarded* **Accredited ACH Professional** *status to 266 electronic payment specialists, pushing the total of accredited professionals to more than 1,000.*

To become an Accredited ACH Professional, you must have two years of experience using NACHA's electronic funds transfer network and pass an exam. Accreditation is valid for five years.

NACHA: (703) 742-9190.

How to get mgmt. aid and snag that hacker

The first of two parts providing practical advice on how to prosecute network hackers.

By Winn Schwartau

You've got quite a dilemma: Hackers jimmied open a network link and made off with the valuable assets that management gave you a reasonable budget to protect — customer data, financial results, software source code and the like.

While the budget might not have been enough for you to emulate security at Fort Knox, you were able to buy the tools necessary to find out how the net was pried open and get the hackers' electronic addresses.

Now you want to do the right thing and go after the intruders, find out who they are and prosecute them. But upper management tells you to fix the problem and do it quietly to avoid unwanted publicity.

That's the dilemma: How do you prosecute your interlopers and still satisfy the bigwigs?

I faced a similar problem at home. My family and I were electronically harassed, annoyed and pestered for four months last year. To solve the problem, I could have gone after the offending hackers via legal channels or continued a personal crusade that was chewing up large amounts of my time.

My wife and family believed there was no question about it: They told me to take the legal route. So I handed the matter over to the Federal Bureau of Investigation (see story, this page).

A similar move could help you, too. But you'll have to overcome management objections.

The first step in your battle is to prepare reports showing that hackers found ways around everything you did to cut them off. As you do this, make sure management understands that the securutiy budget was spent wisely and that you had sound policies in place.

Indicate that you installed an effective firewall and prove that the virus protection mechanisms were successful. Hopefully, you can show that end users followed policy and regularly changed their passwords.

Provide logs from your net monitoring facility to prove that you found the electronic addresses of the mysterious visitors and that you made sure that future messages from those addresses were blocked.

Yet management remains adamant that it wants no attempt at prosecution.

You've got to be ready with counterarguments. Remind executives that security through obscurity is no way to protect networks. Rather, it only encourages more foul play. Explain that if they act fast, the company can come away being viewed as a leader, one that took its obligation to protect future victims seriously (see graphic).

And tell management it's easy to become a leader in prosecuting network crimes. In a two-year study, the Defense Information Systems Agency (DISA) attempted to break into 8,932 network sites and were successful 88% of the time. Furthermore, only about 5% — or less than 400 — of those break-ins were actually detected by the network administrators. And only 22 of those detected were reported to law enforcement officials.

DISA's figures suggest that for every network break-in reported, 399 others go unreported. So ask the executives at your firm if corporate assets are really worth protecting or if they are just paying a lot of lip service to security.

If you're lucky, management will finally agree to take the matter to the next level: an investigation to find out who is behind the network break-ins.

Next week, find out where to turn for help in finding the perpetrators and what role you will play in this type of operation.

Schwartau is president of Inter.Pact, Inc., a consulting firm specializing in information security and electronic privacy, and editor of "Security Insider Report," a monthly newsletter. He can be reached via the Internet at winn@infowar.com or at (813) 393-6600.

Getting management to take the prosecution route

Following are some common objections to taking the prosecution route and practical responses you might try.

Objection (management)	How to overrule it (net manager)
If we admit what's happened, we'll be an industry laughingstock. It'll make for bad public relations.	Citibank admitted Russians cracked the bank's network and stole money, and the PR wasn't bad. In today's media culture, if you admit something, you defuse the bad effects. If you hide it, it becomes 10 times worse.
Our customers and investors will lose confidence in us and question how we can protect their resources when we can't protect our own.	If customers or investors think we're hiding something, we're really in trouble. Furthermore, as more internal people learn about what's happened, how long can it be kept secret?
The board of directors might blame upper management for the problem, in which case, we'll have to call you on the carpet.	As long as we remain honest, the board could wind up looking like heroes of the new cyber age, standing up to those who would thwart progress.

more on-line

Share your experiences in prosecuting network hackers or let your peers know about the walls you've hit when attempting to prosecute a case in a special conference area on Network World Fusion. From the main menu, select Forum, Conferences, nwfusion.talk then Hackers — The Prosecution Case.

Network World Fusion

Voice of experience

I know all too well the dilemma you face when you realize that someone has electronically stolen some of your corporate jewels.

Apparently, some hackers who are dedicated to outfoxing me, a security consultant, tapped into a GTE Telephone Operations switch that controls my local telephone service and had some fun redefining my account.

As they were playing around, the hackers were kind enough to supply me with the secret designs for GTE's national networks and the source code for the company's How to Catch a Hacker software.

The coup de grace was when the hackers wreaked havoc with my call forwarding and local 911 emergency services. My 78-year-old mother and 10-year-old daughter were confronted with a parade of police, firemen and medical personnel coming to our house looking for the dying persons who had allegedly dialed 911.

Not satisfied that they'd gone far enough, the hackers disconnected my office phones and changed my long-distance carrier.

The hackers then spoofed the electronic identity of a giant jewelry store in order to penetrate my credit files and broke into Florida Power's computers to obtain my utility records.

By now, my friends in the Federal Bureau of Investigation are well aware of my troubles.

It's no fun being the object of hacking. And when something that starts out as a nuisance winds up becoming an invasion of personal and financial records, it's time to call it what it is — a criminal act that requires the intervention of trained professionals and an application of justice.

By Winn Schwartau

THE TOP TEN LIST

10. *#1 in FDDI switching revenue and ports worldwide.*
9. *#3 in LAN switching revenue worldwide.*
8. *#2 in LAN switching revenue and port shipments for Western Europe.*
7. *#2 in Ethernet LAN switching ports worldwide.*
6. *#2 in router units shipped for Western Europe.*
5. *#3 in both high-end and low-end routers worldwide, for both revenue and unit shipments.*
4. *#2 in remote access units for North America.*
3. *#2 in FDDI hub revenue and ports.*
2. *First to have World Wide Web presence on the Internet.*
1. *First to provide complete mobile computing solutions.*

FOR SWITCHING TO DIGITAL.

That's our claim to fame. Now you have the opportunity to join a team where everyday can be a landmark in shaping the dynamic information needs of the ever-changing networking terrain. If you love a fast-forward atmosphere, where change is embraced, and a constant, read on. Digital offers very competitive compensation and full benefits. Please send your resume to: Digital Equipment Corporation, Attn: Staffing and Planning Mgr., Dept. 011 LKG, 550 King St., Littleton, MA 01460; Fax: 508-486-5091. E-mail: jobs-us-networks@digital.com See us on the World Wide Web: www.digital.com/info/careers We are an Equal Employment Opportunity employer.

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NETWORK PRODUCTS BUSINESS

Senior Software Engineer – ATM/Embedded Systems

You will be responsible for the implementation of software for Digital's ATM switch core services and driver codes for interfacing with ATM switch hardware. To qualify, you must have 3+ years' C/assembly, networking, embedded systems and device driver experience.

Principal Software Engineer – Network Management

You will design and develop network management application software for Digital's enVISN architecture. This includes working in such development areas as router management, ATM management, network topology maps, virtual LAN configuration services, and network configuration modeling. Development will be done primarily dealing with Windows and Windows NT. To qualify, you must have 3+ years' software development experience in C and C++ and a solid background in networking, SNMP and network management.

Principal Software Engineer – Remote Access/Wireless LAN

As part of a very creative and successful team, you will develop software for Remote Access/Wireless LAN products which are part of the Internetworking product family. This includes high-quality designing, implementing and testing of Remote Access Network products. To qualify, you must have a BSCS or equivalent, 6+ years' experience, an understanding of embedded systems and extensive experience in C programming. Knowledge of 68000 programming, network products, PCMCIA, driver development, wireless communication, modems, MIBs and security a plus.

Principal Software Engineer – Technical Support

Working in a dynamic and fast-paced environment, you will provide pre- and post-sales support on Digital's HUB and LAN products to distributors and resellers. Acting as part of a team of networking experts, you will also provide detailed in-depth engineering product knowledge to the resellers to facilitate their ability to bid and sell HUB and LAN products. To qualify, you must have a BSEE/CS or equivalent and 5+ years' LAN experience. Direct customer experience a plus.

Principal Software Engineer – ATM

Using your strong understanding of data structure and cache organizations, you will develop ATM LAN emulation and signal codes on a high-performance switching platform that interfaces to Ethernet, Fast Ethernet and FDDI. You will also be responsible for future protocol work for routing over ATM. Working with a common switching and routing code on a team-based project that includes follow-ons is essential. Project also includes leading edge ASIC components and technology as well as clearcase-based development tools in a distributed UNIX® environment. To qualify, you must have a BSCS, 5 years' experience in bridging and routing protocols and assembler coding experience.

Manager – ASIC Design

As the technical and management leader of a group of talented network ASIC designers for the HUB group, you will allocate engineering resources to produce both repeater and switch products. Influencing decisions as to which products to build and developing new repeater and switch designs is essential. The ability to design chips (CMOS ASICs) and negotiate with external vendors is also required. To qualify, you must have a BS/MS in EE, experience with logic/chip design, and a thorough understanding of Ethernet network repeaters, switches and systems.

Principal Engineer – ASIC Design

You will design and test new network repeater and switch chips (usually CMOS ASICs) for the DEChub 900 organization. This includes gate-level design or synthesis, simulation, timing verification and test vector generation. Lab debug assistance of prototype devices may also be required. To qualify, you must have a BS/MS in EE, logic/chip design experience, and the ability to work independently and provide leadership for small groups. Familiarity with CADANCE designs and an understanding of Ethernet networks and switches highly desirable.

Software Manager – Remote Access

Acting in both a technical and managerial role, you will manage a highly motivated software team in the development of ISDN-based remote access products. To qualify, you must have a BSCS/EE or equivalent, 10+ years' software development experience (with at least 3 years in management), and direct experience in developing ISDN products. Knowledge of routing/ WAN protocols and security a plus.

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SR. Development Engineer: M.S. in Chem. E., Mech. E., Electrical E. or Petroleum E. plus 3 yrs. experience on job or 3 yrs. experience as System Manager required (in lieu of M.S., employer will consider Bachelor degree in the same alternate fields of study plus 5 yrs. of same alternate experience also qualifies). Researches, designs, and develops computer hardware and system software for engineering applications in oil field service industry. Applies principles and techniques of computer science, engineering, and mathematical analysis, to analyze software and hardware requirements including the interface to determine feasibility of design, operational and performance requirements of overall system. Develops and directs system testing procedure, and documentation. Provides field support for customers worldwide. Must be knowledgeable in Economic Evaluation of Projects; Reservoir Interpretation; Pumping, Acidizing & Cementing (3 hrs. course work or 1 yr. hands-on experience in each area. These alternate experience requirements are inclusive in the 3 or 5 yrs. experience stated above). $54,000.00/yr., 40-hrs. wk. Applicant must have proof of legal authority to work in the U.S. Apply at Oklahoma State Employment Service 11654A E. 21st. St., Tulsa, Oklahoma 74129 (ID#7209) Job Order# 198120. Ad Paid by An Equal Employment Opportunity Employer

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Systems Analyst. Systems analysis, design development, conversion, integration, and implementation of business applications. Use of relational database systems and development of user friendly interfaces. Use of 4GL languages in multi-hardware/ software platforms using state of the art systems/computer technology. M.S. in Electronics and Computer Technology is required. One year of experience as a systems analyst or one year of experience as a systems engineer is required. Experience must also include six months in programming. Education and/or experience must include use of the following operating systems: SunOS 5.3/4.0, BSD UNIX 4.2, Novell 3.11, DOS 6.0; RDMBS: Oracle 7.0/6.0. Front End Tools: SQL Forms 3.0, SQL ReportWriter 1.11, SQL Plus, Pro C 1.5/1.3, PL/ SQL 2.0/1.0, SQL Loader, IMP, EXP, SQR 2.3. Programming Languages: C, FORTRAN, BASIC, PROLOG. Hardware platforms: SunSparc, HP 9000, Gateway 2000. 40 hours per week. 8:00 a.m. to 5:00 p.m. $44,000 per year. Please send resume to: Brad Lindemann at 3003 E. 98th Street, Ste. 101, Indianapolis, Indiana 46280.

Senior Database Analyst. Interact with users and management to fully understand their requirements. Create detailed system specifications and documentation. Design the back-end database using Gupta's SQL*Base 5.2 or Oracle 7.0 using entity relationships and incorporating referential integrity constraints. Develop front-end graphical user interface applications using Gupta's SQL*Windows 5.0. Use SQL to create tables, indexes, and queries. SQL*Talk is required to import/export data. Train users in the use of new software and provide working knowledge of database administration. B.S. in Computer Engineering is required. Six months as a Senior Database Analyst or six months as a database analyst is required. Experience must also include one year as a programmer. Education and/or experience must include developing software applications using Gupta's SqlWindows and SqlBase or Oracle 7.0 as end database. Use of database design using referential integrity among database tables. 40 hours per week. 8:00 a.m. to 5:00 p.m. $45,000 per year. Please send resume to Brad Lindemann at 3003 E. 98th Street, Ste. 101, Indianapolis, Indiana 46280.

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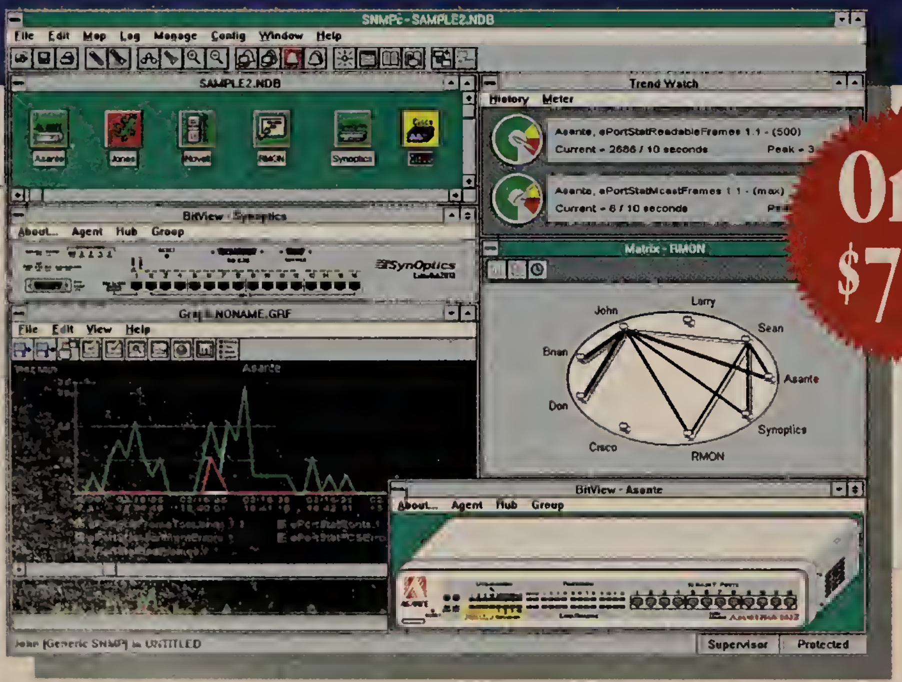

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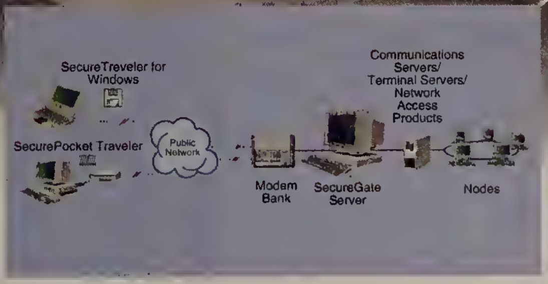
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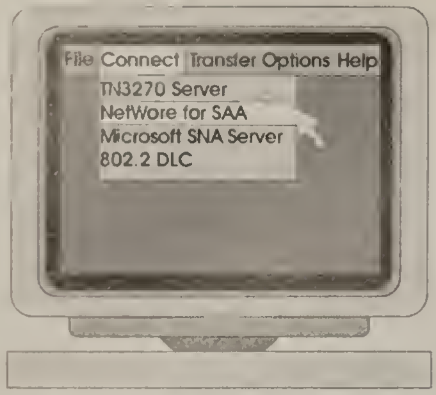

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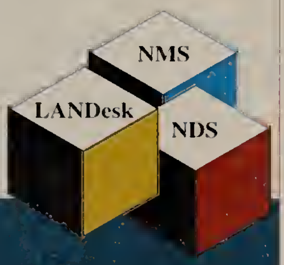

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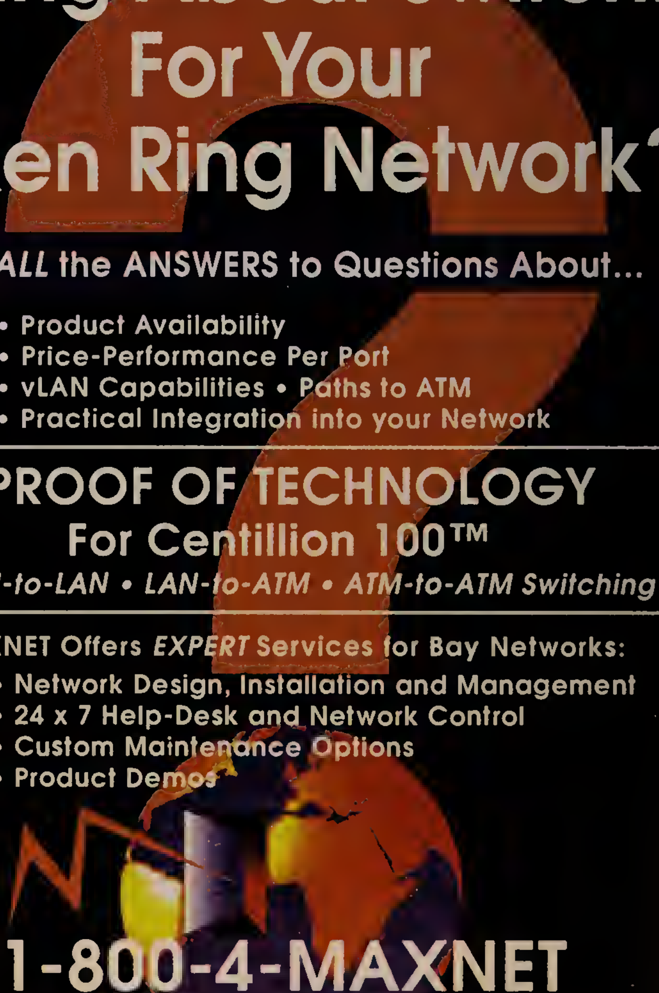

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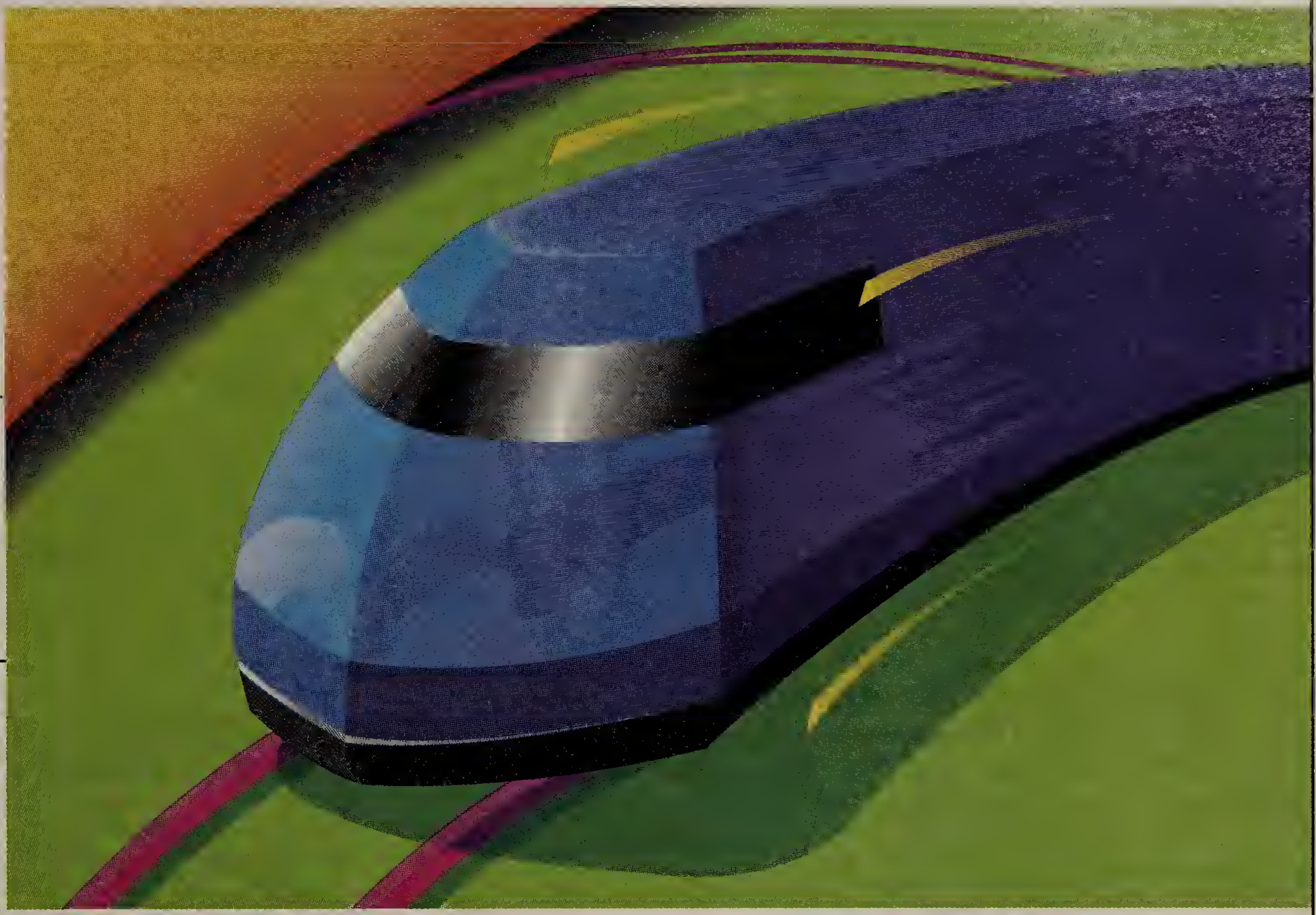

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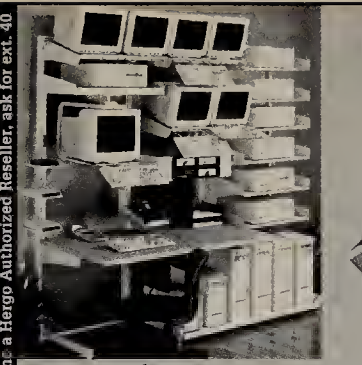

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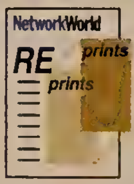

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Notes integration

Continued from page 1

man, a senior consultant at KPMG Peat Marwick, LLP, a Big Six accounting and consulting firm that services many Lotus and SAP clients.

The potential for workflow could be particularly appealing for large corporate Notes users. For instance, a company might have a Notes client tracking system and want product orders to trigger a series of other actions, including the updating of an SAP report.

SAP data might also be imported into Notes for distribution and presentation.

"Lotus was pushing really hard to have [an integration deal] done by Lotusphere, but we are not going to be controlled by that," said Peg Culotta, marketing director of SAP America, Inc., the U.S. arm of the Waldorf, Germany-based company. "SAP has a policy of not announcing things until they are very real.

Various product integrations were a topic of discussion last year at an SAP user conference, according to Barry Simpson, a product director at Colgate-Palmolive Co. of New York. But Simpson said he wasn't interested.

"We have Notes and SAP [applications], but we have no plans to link the two," he said.

Lotus briefed clients and alliance partners last year on its initial game plan, which called for Lotus SmartSuite software to be used for manipulating the SAP documents and for Notes to distribute standard SAP reports, a source said.

But full integration between Notes and SAP's R/3, as well as other packaged client/server applications, would be the ultimate goal, some sources said.

With SAP a red-hot commodity among packaged client/server applications, many large companies are keenly interested in the integration of Notes and R/3.

"People really want these applications to work well together," said Barbara Noti, an analyst at META Group, Inc. in Stamford, Conn. "It's especially important for SAP, which has been blasted for being too proprietary."

At present, a Notes user that wants to work on data from an SAP application would have to use NotesPump, a Lotus data-transfer product announced last fall.

Lotus last year pounded out an agreement with PeopleSoft, Inc., another big client/server application vendor, and is also expected to work with others.

"I don't think Lotus has any intention, nor should they, to limit themselves to SAP," said David Marshak, a senior consultant with the Boston-based Patricia Seybold Group, Inc., citing other firms such as Great Plains Software and Oracle Corp.

According to Chris Ciauri, business alliance manager at PeopleSoft, the vendor has been demonstrating in PeopleSoft 5.0 the ability for Notes to be used as a carrier of PeopleSoft-based workflow applications.

"Our applications have a messaging agent that works with Notes," Ciauri said. "This means in a large organization, you may have some people who are not PeopleSoft users but have Notes. This messaging agent lets you route something from a PeopleSoft [application] to that person via Notes."■

> *"People really want these applications to work well together. It's especially important for SAP, which has been blasted for being too proprietary."*

AT&T

Continued from page 1

in 1997. While covering the cost of the layoffs will hit AT&T's bottom line hard in the short term, it should enable the carrier to reduce its cost structure in the long run. A more cost-efficient AT&T should be better able to hold its own against fierce and hungry competitors looking to make a name for themselves with low prices.

"AT&T is suddenly very aggressive out there," said a top marketing official at one competitor who asked not to be identified. "Now they're competing on price."

Sprint Corp. ought to know about the price competition. Late last year, AT&T deeply underbid Sprint to snare a huge new chunk of the Federal Telecommunications System 2000 mega-contract (see graphic). And on recent major corporate procurements, AT&T was the lowest of three bidders, "or certainly the lowest of two finalists," said Hank Levine, a Washington, D.C. attorney specializing in telecommunications contracts.

"I'm working on some deals right now where AT&T is just buying the business," said Levine, a partner in the firm of Levine, Blaszak, Block and Boothby. "Somebody [at AT&T] has said, 'This market-share drop crap has got to stop.' "

By dropping 40,000 officials — largely in AT&T's fat corporate staff — AT&T sales representatives can dramatically reduce the overhead loading that often must be factored into price negotiations, Levine said.

The change is even being seen on some of the official non-negotiated price lists filed with the government as tariffs. Already AT&T has quietly allowed Sprint to take the high-price banner on most private lines of 500 miles or more.

For example, on 64K bit/sec long-distance dedicated circuits, AT&T now charges 27 cents per mile, while Sprint is up to 35 cents per mile.

AT&T retains an additional fixed charge of $335 per month, compared to Sprint's $299 per month — so for short circuits AT&T's price is still slightly higher than Sprint's. But the net result for AT&T is a flatter price structure that favors longer haul circuits.

Anniversary opportunity

The coming year is particularly crucial for AT&T on big user contract negotiations, whether or not RBOCs and others gain the right to enter the business, Levine said.

In May, the industry will celebrate the third anniversary of 800-number portability, an event that kicked off a vast round of contract negotiations as users gained the leverage to move their inbound long-distance business.

Since the majority of long-distance contracts are three-year deals, an unusually large number of contracts will start coming due during the second half of this year, Levine said.

This year also will see the expiration of a "bulge" of five-year Tariff 12 deals for very big customers signed in the early 1990s, Levine said.

A special threat to AT&T is posed by LDDS WorldCom, which has started to obtain annual usage commitments as large as $10 million from very large users that still retain AT&T or MCI Communications Corp. as their No. 1 carrier.

By contrast, AT&T appears to have gotten a breather from Sprint, which one marketing official for a competitor characterized as having recently "disappeared."

"I've seen very few large customer deals — fewer than I would normally expect — in which Sprint has been one of the two finalists," Levine said. But he added that frame relay is a big exception, with Sprint aggressively going after that business.

Carey Balzer, Sprint's vice president of business market development, said Sprint is now happy to keep its virtual private network and 800 rates at parity with AT&T, rather than maintaining Sprint's traditional sub-AT&T rates. But Balzer claimed the change is due to AT&T recognizing that it no longer can boast a higher quality of service, "so they're forced to price at the Sprint rate."■

AT&T gives government a sweet deal

Under AT&T's recent bid for the last three years of the federal government's FTS 2000 contract:

Average price of an on-net to on-net long-distance minute would be:

Before	After
5.5 cents per minute	**3.5** cents per minute

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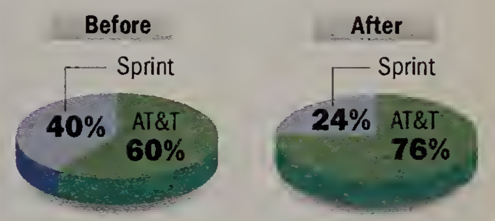

SOURCE: GENERAL SERVICES ADMINISTRATION, WASHINGTON, D.C.

Customers debate changes

Will the sweeping changes at AT&T disrupt the daily life of the carrier's customers?

Most predictions are a qualified no. For one thing, users and analysts claim chances are strong that most customers' account representatives will remain as a consistent, direct interface into the company.

It is more likely that a rep's boss, and that boss's boss, will exit, they said. This is likely to have little impact on customers' day-to-day dealings with the carrier, particularly when things are running smoothly.

Those workers are layoff targets for companies such as AT&T and MCI Communications Corp. that have large, manual legacy systems in place. This is because the function of coordinating a paper trail of service orders and account information has been largely displaced by automation, explained Christine Heckart, broadband consultant at TeleChoice, Inc., a consulting firm based in Verona, N.J.

Chicago-based Baxter Healthcare Corp., an AT&T Tariff 12 shop with a lot of clout, wonders if eliminating layers of management will help or hinder the problem escalation process.

"If you can take a couple levels out and still accomplish what you need to accomplish — and hopefully even expedite processes — that is a positive," said Ken Yorgensen, Baxter's director of computing operations and telecommunications.

But he noted that some account managers' strength is their knowledge of how the AT&T internal structure works and "how to get things answered. When you restructure, [those workers] lose some of that knowledge," he pointed out.

Tom Maile, vice president of telecommunications at CBS, Inc. in New York, an AT&T shop, said he "wouldn't expect many changes" in how he deals with the new, downsized AT&T services company. "After all, they have to compete. What Bob Allen's doing makes sense. AT&T is a big, big company that has to keep in step."

It is not clear whether a leaner staff would hurt or help small companies, which already often get the short end of the stick.

One such firm, which dumped AT&T after six months in 1994 because of mismanaged service expectations and billing nightmares, already thought the company structure "was confusing, with no clear line of command," said Jim Dimlow, vice president of information systems at the California Business Bureau, a collection agency in Monrovia.

Dimlow said he does not hold out much hope that this restructuring will help that situation.

By Joanie Wexler

'Net device

Continued from page 1

company, based here, is developing a set-top box with high-bandwidth access to the Internet.

And the Stellar One box will come with one thing larger competitors may lack: a close connection to AT&T's existing secure national NetWare network. This public IPX net, AT&T NetWare Connect Services (ANCS), is designed to support electronic commerce and reliable intraorganizational networking.

The box, due this year, will include Novell, Inc.'s Nested NetWare communications protocols, which provide easy links to ANCS and other NetWare nets, or to an Internet service provider via IPX or TCP/IP.

Access is not enough, though; users need a reason to link these devices — which employ a television or PC for display — to the World-Wide Web. So Stellar One is building a set of servers and authoring tools designed to make it easier for corporations to produce live-video and other multimedia applications, said Richard Jones, chief scientist for Stellar One.

Access is not enough, though; users need a reason to link these devices — which employ a television or PC for display — to the World-Wide Web.

The product line, code-named NOMADS (for Networked Object Multimedia Application Development System), includes a high-performance video server and a set of authoring tools. It also includes a new set-top box, called a residential gateway, that has ports for high-speed Asymmetric Digital Subscriber Line (ADSL) modem connections as well as Ethernet, token-ring, T-1 or Asynchronous Transfer Mode links, Jones said.

The residential gateway will also support Novell's Powerline protocol for net links across electrical power lines.

The NOMADS products are primarily designed for interactive television and video-on-demand applications being run by telecommunications companies and other content providers, Jones said.

The products could be used to distribute video content within a corporate network and to provide telecommuters with high-speed connections to the Internet without requiring them to own PCs, Jones said.

The weak point for the gateway is its dependence on modem links using ADSL, which is not widely available yet.

Jones expects ADSL to spread quickly as telephone companies compete more vigorously with cable and utility companies to provide video-on-demand and other high-bandwidth services.

Even without ADSL connections, the residential gateways could find a home in corporate offices.

The set-top box includes a simple routing function that can shunt excess bandwidth to other devices as well as a hub card that can convert ATM traffic to Ethernet.

With that configuration, a company could set up a residential gateway with an ATM connection and use that pipe to carry several streams of video or data. The gateway could convert the streams to Ethernet or token-ring traffic and route them to workstations across the LAN.

The residential gateway will probably sell for between $250 and $750, depending on connection options.

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Brainstorm

Continued from page 10

Navigator. Groupscape applications interface directly to Notes servers via Notes Release 3 or 4 client Dynamic Link Libraries.

Liu estimates that three-quarters of the 3.3 million Notes users also have Netscape browsers, and he's hoping that plenty more of the 30 million Netscape clients will want Groupscape. "Our goal is to go after the installed base of Netscape," he acknowledged.

That may be where the product's future lies. David Marshak, a senior consultant with Boston-based consultancy Patricia Seybold Group, Inc., thinks Groupscape has a "limited lifespan" of six to 18 months with the Notes target audience. "The middle of this year, Lotus has promised to support HTTP directly in Notes servers, which means that you will not have to have any special equipment or development to view Notes files from within Netscape or any other Web browser," he said.

Until that time, Marshak thinks the product will be "very interesting for many companies that haven't decided where they want their users to live and what the role of [Web] browsers is.

"There are a number of people who are saying everybody's going to work only in Web browsers, so it makes sense to test that idea," Marshak said.

And Liu pointed out that Lotus Notes' promised Web integration will be available only to Release 4 users and will not permit the sort of "full-blown interactive" applications that Groupscape affords.

Liu said Brainstorm plans to offer a variety of templates — prebuilt, shrink-wrapped applications — within the next two months for those not inclined to develop their own applications. In the meantime, a Groupscape Notes Browser that lets corporate end users view and browse internal Notes networks is downloadable for free from Brainstorm's Web site.

Later in the year, Brainstorm will branch out, releasing Groupscape for competing groupware products, including Microsoft Corp.'s Exchange Server and Novell, Inc.'s GroupWise XTD.

During the first quarter, Groupscape 1.0 for Lotus Notes will be available in two versions:

■ The Standard Edition, priced at $995 per developer seat, will enable users to build Web applications integrated with local Notes databases using a Visual Basic-compatible language.

■ The Pro Edition, priced at $3,995 per developer seat, will support connectivity with remote Notes servers running on Windows, Windows NT, NetWare, Unix and OS/2, as well as with enterprise relational databases, such as those from IBM, Informix Software, Inc., Oracle Corp. and Sybase, Inc. The higher priced version also supports OLE/OCX objects and Java applets.

A Groupscape Enterprise Edition, scheduled to ship in the second quarter, will go a step farther than the Pro Edition, offering a remote procedure call mechanism for linking to transaction monitoring systems such as Novell's Tuxedo and Open Environment Corp.'s Encina.

A planned future release also will support JavaScript within the development environment, according to Liu.

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VG-AnyLAN

Continued from page 1

peaters and LAN switches based on the pumped-up VG-AnyLAN technology could be out in the next 18 to 24 months, he said.

Although that means products could be a ways off, the schedule fits right in with Kevin Walsh's time frame for implementing a 1G bit/sec backbone. Walsh, network specialist at the University of California at San Diego, is currently using HP's 100VG-AnyLAN hubs and likes the idea of extending that technology to support higher data rates.

"The 802.12 gigabit implementation is very appealing because I wouldn't have to worry about any kind of LAN emulation or packet translation like I do with ATM," he said. "This gives me a uniform protocol going through the entire network."

Walsh said he will require a super-speedy LAN backbone technology when he starts to run high-bandwidth audio and video applications over his network.

Dove said that the most likely usage for 1G-AnyLAN, which will run over fiber-optic cable, would be for interconnecting multiple buildings within a campus.

Standard specifics

The new 1G-AnyLAN technology uses the same demand priority protocol — an access method providing support for time-sensitive applications — that exists at 100M bit/sec. It would just support higher data rates.

Like all other fast LAN technologies, net managers will need to install a bridge between different speed devices to support backward compatibility with existing LAN devices.

HP's Dove expects the gigabit LAN standard coming out of the 802.12 committee to be technically superior to its Ethernet counterpart.

He pointed out that 1G-AnyLAN will be deterministic, providing a much higher sustained throughput than collision-based Ethernet technology. A 1G-AnyLAN net would offer 960M bit/sec throughput, while Gigabit Ethernet would max out at about 700M bit/sec, Dove said.

Another advantage of the 802.12 approach is that the technology could support a 2-km topology, whereas Ethernet's carrier-sense multiple access with collision detection scheme only allows for a 20-meter topology, Dove said.

Another differentiator is that 802.12-compliant devices offer quality of service features similar to those supported by ATM, he said.

Dove figures that Gigabit Ethernet and 1G-AnyLAN products will be priced comparably. He estimated that HP will be able to offer a 1G-AnyLAN multiport repeater for the same price as a 100M bit/sec switch, which currently costs about $1,000 per port. However, he said a 1G bit/sec switch would be considerably more expensive. ■

Back to Reality

AT&T's plan for deregulation comes at a big human cost

Oscar Wilde once reminisced, "When I was young, I used to think that money was the most important thing in life; now that I am old, I know it is."

So do the 280,000 "nonessential" furloughed federal employees and the 480,000 others, who, as "emergency personnel," have the bad luck to work without pay.

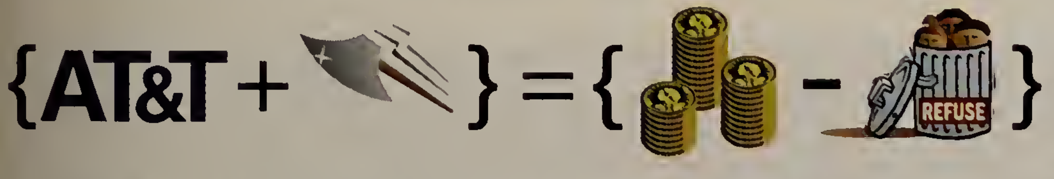
David J. Buerger

At least federal workers eventually will be paid. AT&T last week announced it will permanently furlough 40,000 jobs in conjunction with its planned three-way breakup. That's twice the original expectation and is in addition to 8,500 jobs being cut from AT&T's GIS division.

According to the Jan. 2 memo from AT&T Chairman and CEO Bob Allen to his employees, the job cuts will enable the company to:

- "Restructure into three independent companies so they will be better able to execute their strategies." (Translation: "We're whacking off limbs to avoid tripping on each other's feet.")
- "Focus on strategic businesses that add value to customers and offer us the greatest opportunities for success." (A polite way to warn the Baby Bells: "Roll over and die 'cause we're grabbing your customers!")
- "Improve our cost structure and operating efficiency so we can meet exploding competition in all our markets." (Further proof that "efficiency" is simply cutting down on other people's wages.)

In fairness to Allen, he had little choice initiating these gut-wrenching steps. The $81 billion giant is poised for the fight of its life in what future historians will call the most pivotal year in telecommunications.



Passage of the pending telecommunications reform bill now before Congress will mark the beginning of the end of U.S. telecommunications monopolies. Customers will eventually be free to choose technologies and suppliers like never before.

Local phone companies will start selling long-distance service. Some will also take a stab at selling video service, competing with cable companies. The latter are getting ready to sell telephone and Internet access services through cable systems, while long-distance companies hope to sell all of the above.

As regulated monopolies, AT&T and the Baby Bells have become grossly inefficient, charging high prices to support fat bureaucracies. Before competition, growth pressure mainly stemmed from a terminal need to feed their own bloat. In AT&T's case, about 10,000 of those to be jettisoned are from finance, IS (Hitting too close to home?), human resources and public relations; 60% of the 40,000 are managers.

The motive for regulatory reform is not political; it's money-driven — corporations seeking new cash from previously forbidden markets. Players that lust after new markets must spend big bucks to compete. AT&T, MCI and Sprint have pledged to spend billions of dollars to build new local infrastructures to compete for local services. Baby Bells will do likewise to sell long-distance services.

AT&T is shedding people to pay for those capital expenditures. Expect the Baby Bells to soon announce additional staff executions for the same reason. (The local, long-distance and cable markets total over $200 billion. It will be interesting to see how much and how fast this pie grows after vendors fire thousands of people, spend billions of dollars on infrastructure and cut prices to compete against one another.)

AT&T's action presages final passage of the telecommunications reform bill, now mired in a joint conference committee. Its creation has been a gigantic squabble — not among politicians as much as among vested commercial interests. Monopolies used to legislative protection have spent millions of dollars trying to guarantee one last head start.

The bill is currently weighted in favor of the Baby Bells. In effect, it allows them to sell long-distance service sooner than long-distance companies can jump into local markets.

AT&T anticipates this inequity, which is why the company is shedding employees and divesting at light speed. Its generals know that, over time, distances among users will become less important. The real key to vendor power is providing users with access to the network. For example, about one-third of all long-distance calls begin or end in the territories served by NYNEX and Bell Atlantic. It doesn't take a genius to figure out why these two Baby Bells are talking about a merger or joint venture. Partnering with a long-distance company would be icing on the cake.

In addition to swelling vendors' coffers, the competition is supposed to be good for users. Our front-page story this week shows some early benefits in terms of lower long-distance rates charged by AT&T.

The trade-off is that you might never see your favorite AT&T rep again. Severe cost-cutting means customers will have to make due with less service.

Ultimately, AT&T employees' misfortune is your company's gain. If you really felt sorry for them, you'd tell your congressman or congresswoman and senators to kill the reform bill, and you'd tell AT&T to keep its prices high. But you aren't going to do that, are you?

Buerger is an Atlanta-based writer and industry consultant. He can be reached at dbuerger@pipeline.com.

A B E N D

abend *(n)* 1: abnormal end to a computer process **2:** the column that spares no expense to bring you the insights of Internet users and other high-tech wits

The cyberstork cometh

Has it really come to this? A San Diego couple expecting its first child in August has set up a Web page to solicit suggested names for the child. How about "Edgar," like that hideous kid in those Wollongong ads? Submit your proposed name at *http://www.worldexchange.com/dcondie.*

A virtual wedding

Then there's Mike and Jenna, a Boston-area couple that has been posting plans for its Memorial Day wedding for several months on the Web at http://www.xensei.com/users/lebowich/wedding.html. No word yet on whether they'll have a wedding cam set up to beam the nuptials across the 'Net.

101 uses for a dead AOL disk

Last year, we swore in the "Abend" column that we weren't going to make fun of poor old America Online and its starter disks anymore. But then we came back to work last week to find two more of the things in our mailboxes. So the gloves are off, and with the help of the 101 Uses for AOL Disks Web site, here are some more uses for those pesky disks:

(http://www.safari.net/~pam/aoldisks/)

- A flyswatter.
- Construction material for a life-size replica of Stonehenge.
- A money clip. (Use the metal door and discard the plastic case; the "rich nerd" look is in this year.)
- An eye patch (for one-eyed software pirates).
- Glue them to the bottom of the space shuttle and use them as reentry burn tiles.
- Room dividers for hamsters.
- A refrigerator magnet. (Glue a magnet to the back.)
- Add water and special plant life to make a Chia-disk.
- A noisemaker for bike spokes. (Why damage valuable baseball cards?)
- Snack trays (great for holding hors d'oeuvres at parties.)

AN OPEN LETTER TO SMC CUSTOMERS

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Sincerely,

S. Robert Levine

S. Robert Levine
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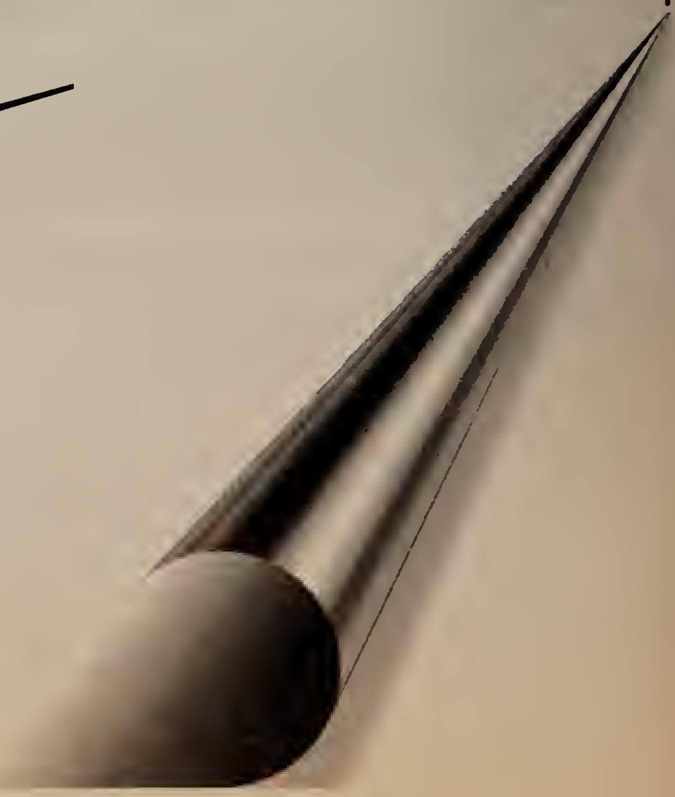

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- Attend the LiveNet tutorial and witness live demonstrations via a connection to LiveNet's backbone.

SCHEDULE OF EVENTS

Conference Sessions:

ENGINEERING TRACK	
Tuesday and Wednesday	**6:15 p.m. - 7:45 p.m.**
SHORT COURSES	
Wednesday and Thursday	**9:15 a.m. - 12:15 p.m.**
	1:15 p.m. - 4:15 p.m.
SESSIONS	
Early Bird	
Wednesday and Thursday	**8:00 a.m. - 7:00 p.m.**
Wednesday	**8:00 a.m. - 6:15 p.m.**
Thursday	**8:00 a.m. - 5:15 p.m.**

Exposition Hours:

Tuesday, January 30	**10:00 a.m. - 5:30 p.m.**
Wednesday, January 31	**10:00 a.m. - 5:30 p.m.**
Thursday, February 1	**10:00 a.m. - 5:30 p.m.**

AN OPEN LETTER TO SMC CUSTOMERS

Dear SMC Customer,

You bought SMC Fast Ethernet switches and switching hubs for the same reason we bought the SMC Business Unit that developed them . . . they're excellent products. The TigerSwitch 100, XLE, and EliteSwitch ES/1 fill an important niche for us here at Cabletron Systems. That's why we can assure you we will continue to support and develop these products.

We believe in protecting the investments of our customers. Your investment in SMC will not only be preserved, but will continue to be enhanced. So you can continue to use your existing SMC network, expand it with Cabletron developed SMC switching products, or seamlessly migrate to the most advanced, intelligent and cost-effective network there is. A Cabletron network. That's because Cabletron is the only networking company that has Synthesis™, a highly integrated line of intelligent hardware and software products that together will create the world's first automated virtual network. (If you're concerned about the spiraling costs of network ownership, you owe it to yourself to learn more about Cabletron's Synthesis.)

It's exciting times at Cabletron, and we are delighted to welcome you to the Cabletron family. Beyond our vision and technical superiority, you'll benefit from our customer training programs, network design and installation services, and fast, courteous service from the industry's largest direct sales and service organization, operating out of more than 90 offices around the globe.

Again, we welcome you. If you have any questions regarding existing contracts, new product development, Synthesis or anything else, please give us a call at (603) 332-9400. And learn firsthand what it means to be a Cabletron customer.

Sincerely,

S. Robert Levine
President and
Chief Executive Officer

Craig R. Benson
Chairman and
Chief Operating Officer

NetworkWorld

THE NEWSWEEKLY OF ENTERPRISE NETWORK COMPUTING

SPECIAL COMNET DISCOUNT FOR *NETWORKWORLD* READERS

Staying ahead of the technology curve is never easy, but we're making it more affordable with our NetworkWorld Early Bird Discount to ComNet '96. It's our gift to you.

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NetworkWorld

Dear Reader,

With a charter to keep readers informed on the latest developments in our fast-moving industry, *NetworkWorld* is proud to be flagship sponsor of ComNet '96 – and offer you the opportunity for significant savings on your ComNet registration.

The staggering pace of innovation in such technologies as ATM, the Internet, electronic commerce and much more make it imperative that professionals accelerate their own understanding of these critical business tools and their bottom line implications. One of the fastest ways to go from puzzled to prescient is through ComNet's intensive and wide-ranging focus on the issues that will matter most to you in the months ahead.

That's why *NetworkWorld* is making it even easier and more economical for our readers to attend ComNet by extending to you a special ComNet offer.

This is your opportunity to join more than 40,000 of your colleagues from around the world by attending this special, once-a year event at a substantial savings off the full Conference and Tutorial Package with this exclusive offer. Just call 1-800-545-EXPO now to register or to get more information. Mention your *NetworkWorld* subscription when you register to receive your discount.

Whether your interest lies in creating effective Internet strategies, incorporating multimedia or wireless into your operations, or wrestling with the increasingly complex issues of network management and network security, ComNet '96, like *NetworkWorld*, offers more of what you need to succeed. More tutorials. More world-class speakers. And more hands-on and interactive sessions than ever before.

You've gotten where you are by staying a head of the curve. Attending ComNet '96 will help keep you there.

Sincerely,

Colin Ungaro
Publisher

PS: Don't forget to call 1-800-545-EXPO **now** to take advantage of the *NetworkWorld* discount.

001

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COMNET®
WASHINGTON, D.C.
Leading Communications into the Global Age

CONFERENCE & EXPOSITION
JANUARY 29 – FEBRUARY 1, 1996

Washington D.C. Convention Center
Renaissance Washington D.C. Hotel

Exposition Hours:

Tuesday, January 30	10:00 a.m. - 5:30 p.m.
Wednesday, January 31	10:00 a.m. - 5:30 p.m.
Thursday, February 1	10:00 a.m. - 5:30 p.m.

No one under 18 admitted.

- Over 500 Companies
- 300+ New Products
- FREE admission into LiveNet, the Vision Dome and the IBM Internet Theatre
- Entry into Keynotes, Plenaries and Federal Forums
- FREE Early Bird Sessions

WRAP

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COMNET®
WASHINGTON, D.C.

TURN THE TECHNOLOGY TIDE IN YOUR FAVOR

Whether you design, build, or manage an enterprise network, this year's ComNet gives you even more of what you need to make informed technology decisions in virtually every area of corporate networking and communications:

- ◆ More tutorials on key technologies and trends.
- ◆ More hands-on classes and demonstrations.
- ◆ More new products to see and evaluate.

A See-Worthy Conference With A Global View

This year's conference focus, *The Enterprise Network Without Boundaries,* delivers an interdisciplinary view of the networking strategies and industry trends that will help keep you and your company competitive, innovative, and entrepreneurial.

ComNet also provides the chance to:

- Predict application performance and bandwidth requirements for new services such as Frame Relay and ISDN.
- Examine the challenges of providing network security for the cooperative electronic workplace.
- Understand how to use the Internet as a business tool and determine what added value online service providers can bring to your organization.
- Get a unified view of how to deliver the remote office, including product requirements and protocols.
- Increase skill levels needed to construct ATM networks, broadband ISDN networks, and implement gigabit networks.
- Overcome networking challenges presented by client/server applications.
- Be prepared for multimedia migration.

Demos And More For That Hands-On Experience

- The ComNet World in Microcosm At LiveNet, a model corporation's network, sponsored by *NetworkWorld.*
- The Vision Dome, a unique 3D immersive environment used to solve problems in telecommunications, GIS and visualization, sponsored by *CommunicationsWeek.*
- The popular IBM Internet Theater, plus free Internet access terminals.
- House of Blues Interactive Music Collaboration Demo.

Customize Your Own Conference Experience

Whatever your interest, whatever your title, you'll find what you're looking for at ComNet '96. That's because ComNet '96 has been designed to let you create the conference experience you want, with everything you need to make you an authority in your field, including:

- **New!** 9 Views and 13 Threads that organize ComNet into functional topics and distinct technology paths so you can follow your interests.
- **More!** 36 intensive one- and two-day tutorials to keep you current.
- **New!** 14 short courses, intensive half-day mini-tutorials that concentrate on your areas of interest.
- **New!** The Engineering Track. Hear technical discussions offering advanced training and insights in an early evening format.
- **New!** Information Superhighway conference tracks explore electronic commerce on the Information Superhighway.
- **Expanded!** Network security, ATM, FDDI, Switched Ethernet, Wireless, ISDN, Multimedia — we cover all the hot technologies.
- **Enriched!** Listen to real-life accounts of technology implementations from the pioneers perfecting them.
- **Free!** Early Bird sessions.

Buoy Your Spirits:

Win A Boat At ComNet '96!

ComNet may leave your head swimming with new possibilities, but it won't leave the rest of you without a proper means of aquatic transportation. Participate in the ComNet Treasure Hunt and become eligible for the Grand Prize drawing for a new boat! Pick-up your coupon booklet at the show to participate.

The BIG Picture

This year's selection of distinguished speakers will open your eyes — and your horizons. Visit ComNet and meet:

- **Nicholas Negroponte**, director and founder of MIT Media Laboratory, predicts how emerging digital solutions will change the face of business, entertainment and education.

- **Jim Barksdale**, CEO of Netscape, examines *The Revolution in Communications and Commerce.*

- **Ed Bennett**, CEO of Prodigy Services, takes a look at the future in his address *Interactivity in the Next Five Years: Speedway to the Home.*

- **Eric Schmidt**, Sun Microsystems' Chief Technology Officer, talks about Java and assesses the commercial potential of the computer network and how it will blossom from the Internet in *Evolving The Internet Into The Networking Decade.*

PLUS

- **Dr. Robert Metcalfe**, V.P. Technology, International Data Group
- **Mary Alice Williams**, corporate spokesperson for NYNEX
- **Douglas Englebart**, inventor of the mouse and the window

The Federal Forum: Doing Business With Uncle Sam

Learn how to do business with the Federal government, and how Uncle Sam is trying to do business using the latest technologies for Electronic Commerce, in this year's Federal Forum. Sponsored by *Federal Computer Week.*

SECTIONS A-F MUST BE COMPLETED TO PROCESS YOUR REGISTRATION.

A. Please Type or Print Clearly.

Name______________________________Title____________________

Company____________________Street________________________

City______________________________State__________ Zip____________

Phone________________ Fax__________________ eMail________________

B. My Company's Primary Business Activity:
(Circle one only)
TRADE RESELLER
1 Computer Consultant
2. Computer Dealer/Retailer
3 Computer Manufacturing
4 Office Products Dealer
5 Service Provider
6 Software Developer
7. Systems Integrator
8 VAR
9 Distributor
10 Other (specify)________________

CORPORATE BUYER (End User)
11 Aerospace
12 Education
13 Financial Services Banking, Insurance, Investment
14 Medical/Healthcare
15 Manufacturing Non-Computer
16 Military/Government/Defense
17 Publishing/Broadcast/Media
18. Telecommunications: Carrier, BOC, Telco
19. Transportation
20. Utility
21. Wholesale/Retail: Non-Computer
22. Other (specify)________________

C. Your Job Function: (Circle one only)
23. Corporate Owner/Officer
24. Administration/Financial Management
25. Consultant
26 MIS/IS Management
27. Data/Telecommunications Management
28. Network Operations Staff
29 Sales/Marketing
30. Customer Services
31. Engineer
32. Analyst
33. Other (specify)________________

D. Product/Technology Interest:
34 Bridges/Routers/Gateways/Hubs
35 Broadband Equipment Services
36. LAN/Interoperability
37 ISDN
38. SMDS /Frame Relay
39. ATM
40. Integrated Voice/Data Equipment/Services
41. Global Services
42. Messaging — Voice, E-Mail
43. Network Management Systems
44. Satellite Equipment Services
45. Wireless Communications
46. Internet/access/applications/security

E. Number of Employees in Your Company: (All locations)
47. Less Than 100
48. 100-499
49. 500-999
50. 1,000-4,999
51. 5,000-9,999
52. 10,000 or More

F. Your Role in Buying Decision:
53 Final Decision Maker
54. Recommender
55. Specify
56. No Role

Call 800-545-EXPO for more information

SECTIONS A-F MUST BE COMPLETED TO PROCESS YOUR REGISTRATION.

A. Please Type or Print Clearly.

Name______________________________Title____________________

Company____________________Street________________________

City______________________________State__________ Zip____________

Phone________________ Fax__________________ eMail________________

B. My Company's Primary Business Activity:
(Circle one only)
TRADE RESELLER
1 Computer Consultant
2 Computer Dealer/Retailer
3 Computer Manufacturing
4 Office Products Dealer
5 Service Provider
6 Software Developer
7 Systems Integrator
8 VAR
9 Distributor
10 Other (specify)________________

CORPORATE BUYER (End User)
11 Aerospace
12 Education
13 Financial Services Banking, Insurance, Investment
14 Medical/Healthcare
15 Manufacturing Non-Computer
16 Military/Government/Defense
17 Publishing/Broadcast/Media
18 Telecommunications: Carrier, BOC, Telco
19 Transportation
20 Utility
21 Wholesale/Retail: Non-Computer
22 Other (specify)________________

C. Your Job Function: (Circle one only)
23 Corporate Owner/Officer
24 Administration/Financial Management
25 Consultant
26 MIS/IS Management
27 Data/Telecommunications Management
28 Network Operations Staff
29 Sales/Marketing
30 Customer Services
31 Engineer
32 Analyst
33 Other (specify)________________

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37 ISDN
38 SMDS /Frame Relay
39 ATM
40. Integrated Voice/Data Equipment/Services
41 Global Services
42. Messaging — Voice, E-Mail
43 Network Management Systems
44 Satellite Equipment Services
45 Wireless Communications
46 Internet/access/applications/security

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47 Less Than 100
48 100-499
49 500-999
50. 1,000-4,999
51 5,000-9,999
52. 10,000 or More

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